The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. VI. No. 153 MAY 20, 1922 Prepaid Annual Subscription United Kingdom, £1.1.0; Abroad, £1.6.0.

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

Editorial and General Offices—8, *Bouverie St., London, E.C.4.*

Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (5 lines).

A Flank Attack

THE discussion on the Dyestuffs and the Safeguarding of Industries Acts, which was raised last week in the House of Commons on the Board of Trade vote, may be described as a flank attack on both measures. Mr. Baldwin, the President of the Board of Trade, set a high standard in his opening speech, and it was well-maintained by succeeding speakers. Captain Wedgwood Benn, who moved the reduction of the vote, was brilliant and penetrative; Sir William Barton almost dangerously conciliatory. On the other side Sir William Pearce brought a weight of experience to bear on the subject and Mr. Woolcock, in addition to experience and knowledge, brought into play dialectical resources which left the House lamenting the infrequency of his speeches. It was a most interesting debate. Its central weakness was that it never raised one single clear issue. Both Acts were attacked in detail from numerous points of view, but the critics shrank from challenging the foundations, and the general effect was rather to obscure the position than to obtain a deliberate judgment on a clear issue.

In spite of the dialectical fireworks the issue is really a very simple and direct one, perhaps more so in the case of dyestuffs than in that of fine chemicals. Are we suddenly to reverse or wholly abandon the policy which the country deliberately embarked on as the result of its perilous experiences during the war? We must either abandon it or continue it; there is no half-way course. Abandoning it would mean the breakdown of our own dyestuffs industry in which great progress has been made, a heavy loss of money, private and public, already invested in it, the loss of a great chemical training ground and a considerable volume of employment, with the ultimate prospect of becoming as dependent on Germany for essential supplies as we were before the war. Very few, if any, can be found frankly to advocate such a policy, when stated in plain terms. If abandonment is impossible, the only alternative policy is perseverance towards a condition of self-dependence, recognising that it may cost something for a time, but that the ultimate advantage will more than repay any temporary sacrifices. These are the courses we must choose between, and most of the criticism and objection falls somewhere between them without directly touching either. It comes not unnaturally from those who wish on any grounds to turn out the Government and are ready to employ any convenient pretext for the purpose; it comes from purchasers who desire the cheapest article the world produces; it comes from those whose business it is to import for sale at home goods produced in the cheapest markets abroad. In detail each object may be good; but is it so good as to justify our scrapping a national industry in the making? It is that point on which conclusive evidence is needed but is not furnished.

Latterly, the objection to the Dyestuffs Act has taken a new and subtle turn. It is suggested that the use of dearer British dyestuffs instead of cheaper foreign dyestuffs is handicapping British textile manufacturers in competition with foreign makers. Here, again, the figures supplied are not very conclusive, though, if the grievance is so serious, examples should be overwhelming. But it would be equally easy to say that the compulsory use of dearer British labour by textile manufacturers, instead of cheaper foreign labour, is a heavy handicap on British producers and to demand the repeal of protective labour laws. We notice that several Lancashire Labour members voted with the critics of these two Acts, apparently because they favour free trade in dyes, produced by cheap German labour, though they would cheerfully bring the industry of the country to a stop rather than permit free

trade in labour. We can understand the merchant importer or the consumer being concerned about his own interests, but the spectacle of Labour members, while themselves enforcing upon industry the most pedantic protective restrictions, piously exclaiming against any temporary protection for an industry of the greatest national importance, must set everyone thinking deeply. If it were proposed to import cheap German labour into Lancashire, the Labour members would probably shout about revolution; but the products manufactured by cheap German labour are apparently regarded by them as very desirable importations. It only shows how largely sectional interests dominate one's point of view; and the only sound policy is to put the collective national interest above party or sectional advantage.

"An Open Letter" on Dyes

It is a relief to turn from the special pleading which distinguishes so much of the debating in Parliament to "an open letter," in the form of a pamphlet, which Mr. James Morton has addressed to "my friends the Free Trade Members of Parliament." The author is the chairman of Scottish Dyes, Ltd., governing director of Morton Sundour Fabrics, Ltd., and chairman of Alexander Morton Sons and Co.; and he speaks with the treble qualification of textile manufacturer, dye user, and dye maker. Politically, he explains, he has always been a Free Trader and a public advocate of Free Trade. His business has been the making of many varieties of textiles and dyeing them with the best procurable dyes; before the war his firm was the largest user in this country of certain types of fast colours and his business was entirely dependent on them. "When the war suddenly deprived us of supplies," he tells us, "I was foolhardy enough to think that we could tackle the making of these complex dyes for ourselves, and by October, 1914, we had chemists busy at work. It was a long, tedious, and costly process, but we managed to keep our end up, first with laboratory spoonfuls, then with pounds and cwts., till we are now producing, on a scale equal to the total demands of the country, not only the essential colours of our programme but some quite new dyes that are the envy even of makers abroad."

On the basis of this unique technical and commercial experience, Mr. Morton examines with a Scottish thoroughness the present position and problems of the British dyestuffs industry, and no simpler or clearer statement of the case has yet appeared. He disposes without much difficulty of the assumption that the slump in the textile industry is due to the restrictive effects of the Dyestuffs Act. The large foreign purchases made immediately after the Sankey judgment resulted in ample supplies of foreign dyes, and it is only now, when the foreign stocks are being worked out, that the Germans realise the seriousness of the efforts of British makers to take their place for the future. As to the question of price, Mr. Morton points out that it would pay the Germans to sell at any price in this country to regain the British market and kill the British industry. It is already clear that for dyestuffs not produced here they are charging highly profitable prices, while for those colours already being produced in competition with them they are deliberately "cutting" prices. At great expense Mr. Morton's own firm produced "Solway Blue Black." The German price had been 17s. to 12s. 3d. a lb., and now that the British product can be supplied at 12s. 6d. or as low as 9s. 9d. for large contracts, the German quotation drops to 6s. 4d., "a price it is utterly impossible to produce at in this country to-day." Here we have in miniature the whole theory of German competition.

Dealing with this price problem from another angle, Mr. Morton emphasises the importance of mass production. British dyemakers, he points out, have had to base their costs on spasmodic cwt. orders made on plants capable of dealing with tons at a time. "Would it not be possible," he asks, "for some group, corresponding to the Central Importing Agency, to collect approximate requirements for, say, the next twelve months, to place these bulk quantities before the dyemakers concerned here, and to give them the opportunity to base costings and quotations on such favourable conditions? Once let dyemakers get the advantage of the actual bulk consumption of the users of this country and the costs will steadily tumble down. . . . Under some such scheme I venture to say that the first effect would be such a reduction in the prices of British dyestuffs as would astonish the users." The pamphlet, from which only a few points have been selected, may be commended to all seekers after the facts of a difficult situation.

Improving Trade

The reports as to the condition of trade received from widely different quarters are, in varying degrees, all favourable. We hear of firms who are "not doing so badly," who "cannot complain," who have "booked a few decent orders lately," and so on. Such confessions, in the present circumstances, are reluctantly made as a rule, and one may infer that the actual improvement is at least equal to the admission. There is, of course, no great rush for stocks yet, nor has the improvement affected all classes of manufacturers and traders; but quietly an improvement is setting in and the evidence favours a steady, if not rapid, development. The fact that business is still of the "hand-to-mouth" order is easily explained by the reluctance of business men to commit themselves any distance ahead. Forward business of any bulk depends on confidence, and this can only come as trading conditions become more stable throughout the world. When commercial confidence has been once more really restored a steady and progressive resumption of business seems reasonably probable, and meanwhile any stray signs of positive improvement are to be noted with real satisfaction.

Money is certainly not scarce, as is demonstrated by the rush for new issues at prices very much less favourable than those that quite failed to attract twelve or eighteen months ago. Most of this spare cash goes, it is true, into the gilt-edged class of security, and we are having the unusual spectacle of comparatively cheap money after the most costly war on record. When industry, however, has recovered its normal stability, industrial investment may also recover something of its normal attractiveness, and good propositions will not be held up for lack of capital.

Annual Reports on Applied Chemistry

WE have just received for notice a copy of the volume issued by the Society of Chemical Industry containing the usual reports dealing with the progress made in various branches of applied chemistry during the past year. The opinion has previously been expressed that of the technical literature which is disseminated from Central House these reports are probably the most valuable, not only by reason of the important facts which they contain but because of the comprehensive manner in which both subjects and names are indexed, thus making the information particularly accessible. The chief value of the volume lies in the fact that it forms a record of all recent developments, and as such it is an essential auxiliary to almost any text-book dealing with the main branches of applied chemistry, for it begins where the text book must necessarily get left behind. It may be pointed out that purchase of the book is not confined to members of the Society. Non-members may obtain it, although the charge to them (12s. 6d.) is five shillings more than the cost to members.

These reports deserve the fullest support from all engaged in chemical industry, for the cost of production must be by no means small, and it would be a matter for regret if so admirable a piece of work were to become a liability rather than an asset to the Society in these days when most bodies of the kind are in anything but opulent circumstances. So far as the twenty-five individual contributors are concerned, the task they are set is anything but a sinecure. The work involved in the collation of information of the kind is by no means represented by the final appearance of the reports. An enormous mass of literature, both English and foreign, has to be consulted, and this has then to be "boiled down" so that no facts of importance are omitted. The volume covering the year 1921 is the sixth of the series, and once more Mr. T. F. Burton, the editor, may be congratulated.

Chemical Trade in April

TAKING the April Board of Trade returns as a whole the upward tendency of trade has suffered a check, imports being £7,218,000 and exports £9,073,000 below the previous month's totals, but the detailed figures for chemicals, drugs, dyes and colours do not bear out the suggestion of a general falling off of export business. Taking into account the fact that March was the record month of the year and that the Easter holidays fell in the month under review, the decline of £111,306 in imports and of £75,278 in exports is hardly so discouraging as a perusal of the daily Press would seem to indicate. The deletion of cream of tartar from the Board of Trade's list under the Safeguarding of Industries Act is reflected in the increased imports of that commodity, the quantity having jumped from 4 cwt. in March to 794 cwt. in April. Excluding the latter figure, the total imports this year of cream of tartar amount to 143 cwt. In April, 1920, no fewer than 3,204 cwt. were imported. On the export side there is an encouraging improvement in sodium and potassium compounds, although decreases are noted under sulphuric acid, sulphate of ammonia, and tar oil and creosote.

Points from our News Pages

The administration of the Dyestuffs Act and the Safeguarding of Industries Act was the subject of a lengthy debate in the House of Commons on May 11 (p. 656).

At the annual meeting of the Oil and Colour Chemists' Association, Dr. J. Newton Friend was elected president. At the annual dinner references were made to the Association's relations with the Society of Chemical Industry (p. 658).

A technical correspondent discusses the industrial applications of chlorine and predicts its wider use in chemistry, medicine and surgery (p. 652).

The Board of Trade returns for April indicate increased exports of sodium and potassium compounds and considerable decreases under sulphuric acid and tar oil and creosote (p. 661).

Inquiries under Part II of the Safeguarding of Industries Act are in progress respecting the British glass bottle industry and British optical and other scientific instruments. An inquiry respecting incandescent gas mantles will be opened on May 31 (p. 660).

Our London Market Report states that trade is improving, and that the weight of goods moving is steadily increasing (p. 669).

Our Scottish Market Report records a marked improvement in business during the past week with numerous inquiries, particularly for export (p. 671).

Books Received

THE PHYSICAL SOCIETY OF LONDON: PROCEEDINGS. Volume XXXIV., Part III. London: The Fleetway Press, Ltd. Pp. 126. 6s.

THE ANALYSIS OF NON-FERROUS ALLOYS. By F. Ibbotson and L. Aitchison. Second Edition. London: Longmans Green & Co. Pp. 242. 12s. 6d.

The Calendar

May		
23	Royal Photographic Society: Technical Meeting.	35, Russell Square, London.
23	Royal Institution, Tyndall Lectures: Tyndall's Biological Researches and the Foundations of Bacteriology. 3 p.m.	Albemarle Street, Piccadilly, London
23	Glass Bottle Inquiry resumed.	London.
24	Royal Society of Arts: "The Natural Power Resources of Ireland (Coal, Peat, Water Power.)" G. Fletcher. 8 p.m.	John Street, Adelphi, London.
24	Chemical Industry Club: "The Fertiliser Industry in the U.S.A." Dr. Lipman. 8 p.m.	Whitehall Court, London.
25	Royal Microscopical Society, Metallurgical Section: "Notes on Etching and Etching Reagents." L. S. Ward. 7 p.m.	20, Hanover Square, London.
25	Royal Society: Papers by Professor C. H. Lees, B. F. J. Schonland, Sir E. Rutherford, N. K. Adam, W. B. Hardy, E. Wilson, J. W. Nicholson, S. F. Grace, G. I. Taylor.	London.
25	Sheffield University: "Ammonia from Coal." Professor J. W. Cobb. 5.30 p.m.	The University, Sheffield.
26	Physical Society: Ordinary Meeting. "Recent Work with regard to the Influence of Soil Conditions on Agriculture." Dr. E. J. Russell.	Imperial College of Science, London.
31	Scientific Instruments Inquiry resumed.	London.
31	Incandescent Gas Mantles Inquiry opens.	London.

Some Industrial Applications of Chlorine

Uses in Industrial Chemistry and Medicine

The writer gives a concise account of the various manufacturing processes, and deals with the many purposes for which chlorine and its compounds are used in industry. He anticipates that with further research chlorine will find many new uses in industrial chemistry and in medicine.

THE economic production of chlorine and its manufacture as a by-product in a number of industries has made possible the utilisation of chlorine on a commercial scale. Its use has also been fostered during recent years, consequent on its massed production—much in excess of any immediate demand—at factories manufacturing caustic soda electrolytically from brine. Several attempts have been made towards converting this chlorine into hydrochloric acid, but up to the present no process has been found which could be adopted commercially. This would be an inversion of the processes now in use where hydrochloric acid is converted into chlorine. Nagel* records having converted chlorine into hydrochloric acid by passing equal parts of chlorine and steam at 1,000° C. through a column of heated coke, the course of the reaction being as follows:—

$$Cl_2 + H_2O + C - 2HCl + CO$$

The principal manufacturing processes now applied for the production of chlorine are the following:—

(1.) THE WELDON PROCESS.—This consists essentially of the treatment of a mixture of hydrochloric acid and manganese dioxide, by means of lime, producing calcium manganite, or as known commercially Weldon mud, $CaO.2MnO_2$, which is decomposed with hydrochloric acid giving chlorine.

(2.) THE WELDON PECHINEY PROCESS.—In this operation atmospheric oxygen is utilised for the liberation of chlorine from a mixture of magnesium chloride and oxide at a temperature of 1,000° C. This process is rendered continuous by restoring the magnesium chloride by addition of hydrochloric acid.

(3.) THE DEACON PROCESS.—The feature of this process is that in the presence of a catalyst, and at a temperature of 430° C., atmospheric oxygen acts directly on hydrochloric acid gas. The hydrogen combines with the oxygen, setting free the chlorine. The most efficient catalyst appears to be cuprous chloride, impregnated into a porous material, *e.g.*, pumice stone. Copper, iron, chromium and nickel salts have also been used as catalysts.

(4.) ELECTROLYTIC PROCESS.—In this case, chlorine is produced simultaneously with caustic soda, by the electrolysis of a concentrated solution of brine, the chlorine being liberated at the positive carbon electrode. This method has been attended with much commercial success in districts where natural water power is available. Electrolytic chlorine, however, is disadvantageous for the production of bleaching powder, an excessive amount of the chlorine combining as calcium chloride, immediately on contact with the lime. This is possibly due to the chlorine being in a "status nascendi," and hence in a state of extreme activity. A patent has been granted whereby this difficulty is overcome, the chlorine being heated to 800° C. prior to absorption.

During the war it was produced in Germany to a considerable extent by the action of 50 per cent. nitric acid on chlorides found in the Strassfurt deposits. It is claimed that the nitric acid acts as a catalyst and is recoverable, unchanged.

Bleaching

The outstanding industrial application of chlorine is as a bleaching agent, and it was initially brought forward as such by Berthollet in 1785. Its bleaching capacity is its most characteristic property and also its most valuable from an industrial standpoint. This bleaching power is due to the oxidation of the colouring matter, the oxygen being obtained by the decomposition of water by means of the liberated chlorine. Dry chlorine is inert and has no bleaching activity. The particularly energetic bleaching action which is produced in the presence of moist chlorine is assumed to be due to the presence of oxygen in an atomic state. Its introduction into the bleaching industry completely revolutionised the methods in vogue at the time, as the operation could be carried out much more expeditiously than was formerly possible by means of sunlight. The most convenient chlorine compound for use is chloride of lime or bleaching powder, which, suspended in water, is termed bleaching liquor.

Bleaching powder is now manufactured on an extensive scale, mainly for the bleaching of linen and cotton goods, and also for use as a disinfectant. It is produced by the interaction of chlorine and slaked lime at ordinary temperatures. The hydrated lime is spread in thin layers over tiers of shelves in a chamber through which chlorine is slowly passed.

It was formerly believed that bleaching powder was a mechanical mixture; recent researches have shown conclusively that a product can be prepared containing no free calcium chloride. Its properties resemble those of the salts of hypochlorous acid in that decomposition takes place in the presence of weak acids.

Industrial Applications

The principal industrial applications of bleaching powder are for the bleaching of cotton, linen goods, pulp, straw, wood, starch, vegetable textiles, and extensively for the sterilisation of water on the large scale. The activity of bleaching powder as a germicide is due to the liberation of nascent oxygen, which is most destructive to micro organisms. In this respect, bleaching powder is considered one of the most powerful disinfectants, the carbonic acid of the atmosphere inducing the desired slow decomposition.

Hewlett has shown that 1 part of bleaching powder in 1,000,000 parts of water is sufficient to destroy B. Coli in 30 minutes; and also that its efficiency depends only upon the concentration of the active chlorine, and not in any way to the period of exposure. There appears to be some controversy on this question, one section of bacteriologists maintaining that some bacteria have remarkable capacity for resisting the penetration of chlorine or oxygen.

Sodium hypochlorite has also been used in a few instances in preference to bleaching powder, it has the advantage of being miscible with water, and oxidises energetically with the evolution of oxygen.

A number of the hypochlorites have been introduced into surgery, as they possess rapid healing properties. They are usually admixed into carbolic acid dressings, probably with the formation of some small quantity of chlorophenol. For this purpose crystallised calcium hypochlorite is now prepared by treating lime water with chlorine, subsequently evaporating under reduced pressure, with elimination of the calcium chloride by fractional crystallisation. A very concentrated compound is produced possessing 85 per cent. available chlorine, which is a decided advantage over the 35 per cent. contained in a good quality bleaching powder.

Liquid chlorine is now a commercial product and prepared on a manufacturing scale, being distributed in metal cylinders, lined with lead. During war time, the German military authorities utilised high pressure tank waggons for its conveyance.

At 0° C., chlorine gas may be liquefied at a pressure of six atmospheres; however, it has been found preferable to use frigorific mixtures rather than high pressures, as liquefaction occurs at −34° C. at ordinary pressure. In liquid state, chlorine has found wide application, consequent on its ease and facility of transit, and also to being the active agent in the concentrated form. It is now utilised extensively for the extraction of gold from its ores in isolated districts, and has been found to be very efficient. The pulverised ore is calcined, treated in revolving chambers with moist chlorine, the gold chloride washed out, precipitated as sulphide, and roasted.

Liquid chlorine is used in Germany for the extraction of bromine and iodine from the Strassfurt salt deposits, in the manufacture of aniline dye intermediates, for the preparation of chloracetic acid used in the synthesis of indigo, and isoprene for the synthesis of rubber. In the dye industry, chlorine is

* *Chem. Zeit*, 1912. XXXVI. p. 54.

used in the preparation of phosgene, an important compound in the production of the various phenyl methane dyes, for the manufacture of benzyl and tolyl urethanes, and for making direct dyeing agents, *e.g.*, sulphur black. It has found a wide field of application in the chlorination of organic compounds; the following are now prepared on a commercial scale: chloroform for surgical purposes, chloral used as an hypnotic, and carbon tetrachloride, which, together with the di and tri chlorethylenes are used for fire extinguishing purposes, and as non-inflammable solvents for crystallising organic compounds.

Chlorine in the form of liquid is now much used for the sterilisation of water supplies. Zankau* states that in October, 1915, 150 water plants in America alone used liquid chlorine, the Philadelphia bacteriological water tests showing a reduction in bacteria from 20,000 to 10 per c.c., with the use of 1 part chlorine to 3,000,000 parts of water. In a number of the water works, the chlorine is introduced by passing the gas through a column loosely packed with porous material, through which the water runs. The patentee claims that by this means a much more active sterilising agent is produced, possibly consequent on the initial presence of chlorine, nascent oxygen, hypochlorous acid and hydrochloric acid. In Germany a continuous stream of water and chlorine is allowed to pass through a tank containing baffling plates, and automatically fed to the service pipes at the reservoir outlets. This innovation has the advantage of being conducted in the absence of light, in which the decomposition of the hypochlorous acid takes place slowly.

Liquid Chlorine

Liquid chlorine has also been used for the bleaching of coral, horn, ivory, engravings and feathers. During the war period, its production became an industry of first-rate importance in all the belligerent countries. It was utilised largely in processes for the production of various high explosives, *e.g.*, chlorbenzene, chlor-picrin, picric acid. The preparation of polyhydric alcohols by the hydrolysis of halogenated hydrocarbons is an important stage in the production of phthallic acid for synthetic indigo and for the preparation of phenol phthalein. Chlorine was used in gas warfare as such, and later supplemented by more toxic chlorine compounds, that is, phosgene, ethylene chlorohydrin and B B dichloroethyl sulphide (mustard gas).

Phosphorous tetrachloride and silicon tetrachloride were found very efficient for use in scout shells, and also as smoke screens for location purposes, and for concealment of the movement of vessels and troops. These compounds found service in virtue of their precipitation on contact with moisture, producing a dense cloud. Several metallic compounds of chlorine are produced directly by interaction of the gas and the metal, often with incandescence; an example of this is the introduction of finely ground Dutch metal or antimony into a jar of chlorine.

The excess of chlorine in electrolytic processes has found an important outlet in Japan, in the manufacture of chlorates and perchlorates for use in gunpowder and various types of blasting explosives. It has also been harnessed for the bleaching of natural organic colouring matter, that is, xanthophyll, crythrophyll and chlorophyll, contained in various oils, fats and waxes.

With further research it is anticipated that chlorine in various forms will find still wider applications in chemistry, medicine and surgery, and in technical and industrial operations generally.

British Beet Sugar Industry

THE British Beet Growers' Society, Ltd., has issued a pamphlet, in which is outlined the case for State assistance for home-grown sugar. It is pointed out that the remission of the Excise duty on sugar is admittedly a bounty to the infant sugar beet industry, and that this bounty is required for experimental expenditure during the period of establishment. An honest attempt, it is stated, has been made to establish the industry without a bounty, under disturbing economic conditions, but without it the two existing factories at Kelham and Cantley are unable to carry on. With the remission of the Excise duty they can continue with confidence. In proof of this already over 7,000 acres of beet are being planted.

*Zankau (*Z. angew. Chem.*) 1916. XXIX. p. 178.

Disposal of Corrosive Effluents

THE irrecoverable by-products from many chemical industries frequently lead to trouble with the sanitary and river pollution authorities or, if the works is on the coast, the Fisheries Department. Again, they may be equally objectionable when run into ordinary sewage systems. To the executive, however, many effluents are regarded with more concern during their handling and conveyance prior to their leaving the works site than afterwards, when the nuisances they create are usually felt more by other people. This is an entirely human view, especially as the production of a corrosive effluent gives rise to an unduly high "repair and maintenance" item in the "standing charges" account.

An effluent may be unusually corrosive to works equipment without being very harmful to health or objectionable to authorities. A small acidity may give rise to excessive corrosion of the channels in which the liquor leaves the works, —*e.g.*, an acid or basic salt, in dilution. A suspension of a chemically active sludge may be equally productive of trouble. The cause of the corrosion is a question which is usually solved in the laboratory with complete success. The necessary repairs arise from a multitude of causes attributable to the effluent.

Examples which have come within the writer's experience are given below. In the first example, an acid liquor from a washing plant was conveyed from a second floor to the main drain in the usual wrought iron pipe. Lead piping was prohibitive in price and in addition is difficult of removal and clearing in the event of a stoppage in the washer. This pipeline was constantly being renewed, as the acid quickly penetrated the screwed threads of the joints and, dropping into bags of pure product stored in the ground floor, did considerable damage before it was detected.

Another case occurred when the acid liquor (H_2SO_4) was run into a drain, the joints of which were "made" with an ordinary cement. This cement being attacked, in course of time resulted in the main drain leaking, and subsequently the surrounding earth became "swamped." Iron drums containing a solvent were stacked in the ground and were badly corroded on the rings, which had sunk into the ground. For some time neutralisation at considerable expense was seriously considered. Most works have had, at one time or another, trouble from this source. Even the storage of main effluents prior to their convenient disposal presents many an acute problem. Wooden vats are perhaps most suitable, but the iron stays surrounding these are frequently attacked.

The main reason is undoubtedly not sufficiently appreciated, and that is that a dilute acid or acid salt is more corrosive to iron and steel than many concentrated acids. To many works the use of lead or acid resisting alloys would mean a very considerable capital outlay, and the remedy lies in the use of anti-corrosive composition of top quality used periodically and according to a pre-conceived plan. The material decided on as a protective should only be chosen after prolonged and severe test, but it is a fact that acid-resisting compositions exist which cost only a fraction of the capital outlay on lead or special alloy, and, if used regularly, will frequently solve many economic problems of the works manager. Many compositions of a "panacea" type exist which are useless, being manufactured with a lack of requisite technology and "at a price." It is well to take the best, even at an advanced price, from manufacturers who value their reputation too well to foist cheap substitutes on a purchase clerk who is a "keen buyer" but not always discriminating. A high-class bituminous paint is of first class use if of the highest possible make and reputation, also many bituminous enamels; reliable acid-resisting varnishes are also procurable from the best manufacturers.

The process chemist, chemical engineer, or works manager should, after testing with the best brands on the market, insist that the purchase clerk take this product even at a slightly enhanced price. Initial cost of such products is generally the least cost. Labour, in applying an inferior substitute, is generally money wasted, and it should be remembered that cost of application is frequently ten times the cost per gallon of the composition. All metal portions of effluent systems should be periodically coated with the chosen composition at set intervals, and it may be confidently asserted that a difficult problem will be solved to a very satisfying extent.

Reviews

DICTIONARY OF APPLIED CHEMISTRY. By Sir EDWARD THORPE, C.B., F.R.S., LL.D., assisted by numerous experts. Vol. II.: "Calculi to Explosion," pp. 717, 60s. Vol. III.: "Explosives to K." London: Longmans, Green and Co. pp. 735, 60s.

VOLUME II.

Among nearly sixty specialists who have contributed articles to Volume II. of this indispensable standard reference work one notices in particular the names of Sir Dugald Clerk, Sir James Dobbie, Dr. E. F Armstrong, Dr. Lewkowitsch, Professor A. G. Perkin, and Drs. Samuel and Eric Rideal. In dealing with colloids, Professor J. C. Philip remarks that the term is to be interpreted as referring, not so much to a particular class of substances, as to a condition which very many (if not all) chemical elements or compounds may be made to assume. From the modern standpoint, "colloidal solutions" are to be regarded as forming a special group of the physical systems built up from two substances, one of which is present in relatively small quantity. The main groups of such dispersed systems are (*a*) mechanical suspensions, (*b*) colloidal solutions, and (*c*) molecular solutions, the feature which characterises each group being the degree of dispersion of the "dispersed phase." From this point of view, a colloid solution is a dispersed system in which the degree of dispersion is intermediate between that of a mechanical suspension and that of a molecular solution. An idea of the important bearing of colloid chemistry on innumerable technical problems may be gathered from the survey which is given of the many operations in applied chemistry where colloids now enter into the reckoning.

To the chemical engineer and works manager one of the most informative articles is that dealing with the corrosion of metals. Numerous theories have been from time to time advanced to account for the mechanism of corrosion, but it is evident that opinions are widely divergent. Academically, the problem still awaits solution, and for the moment the engineer is mainly interested in the most effective preventive means which are available. Iron in its various forms is the material with which the majority are mainly concerned, and one is struck with the present-day tendency to cover this material wherever practicable with concrete. Consequently, the corrosion of this metal under such circumstances is fraught with unusual importance. So far as after-effects are concerned, everything depends upon the ingredients used, the manner in which they are mixed, and the care with which the mixture is "punned" into position. Given the ideal conditions as regards these three items, there would appear to be no reason why ferro-concrete structures should not last indefinitely, particularly if a water-proofing composition is utilised. Dr. J. Newton Friend deals with corrosion theories and problems in general, while Professor J. S. S. Brame is responsible for the article relating to methods of protection. One notices that the late Professor Lewes' article in connexion with the corrosion and fouling of steel ships is still included, but here and there certain revisions have been made to bring it up to date.

In glancing through a volume of this size, one is intuitively arrested by the heading "Cotton Seed Oil," owing to the enormous dimensions which this industry has assumed, particularly since its possibilities for use, when hardened, as an edible substance were appreciated. As an indication of the magnitude of the industry, it may be noted that the annual import of cotton seed to this country from Egypt, the East Indies, and South America amounts to more than 600,000 tons. In addition, very considerable quantities of cotton seed oil are imported from the United States, which produce nearly 200,000,000 gallons of oil per annum, 25 per cent. of which quantity is exported to Europe. A point in connexion with the cotton plant is that as it yields both seeds and fibre its cultivation must always be more profitable than that of plants which yield a seed only.

Readers will appreciate, of course, that reference to all features of more than ordinary importance in a volume of this kind is impossible, but one cannot conclude without drawing attention to the extended and instructive articles on "Cyanides" (by Dr. Thomas Ewan) and "Dyeing and Dyestuffs" (by Mr. W. M. Gardner, of Bradford Technical College). The persistent attempts to synthesise cyanogen compounds have been renewed during recent years, and important progress has been registered. Attacks on the problem of fixing free nitrogen in this form have been made by several paths, but it remains to be seen whether any of the synthetic processes will be able to hold their own under normal conditions in competition with the older natural sources.

VOLUME III.

Amongst the contributors to Volume III. appear the names of many of those who were responsible for articles in the first two volumes. The new-comers include Dr. Bernard Dyer (Feeding Stuffs and Fertilisers), Mr. C. S. Garland (Gas Mantles), Dr. Harden, of the Lister Institute (Fermentation); Mr. G. S. Newth, with whom, owing to his much-circulated book on inorganic chemistry, every college student is familiar; Professor W. E. S. Turner, of Sheffield University, who treats on glass technology, and his colleague, Professor Arthur Smithells, who is one of the few authorities, if not the only authority, one would care to see dealing with flames. This volume opens with a most comprehensive treatment of "Explosives" by Mr. G. H. Perry, O.B.E., of the Chemical Department at Woolwich Arsenal. It is a little remarkable to find that, in spite of interest at the moment in military explosives being at a decidedly low ebb, this section occupies no less than one-seventh of the space in the whole volume. At first sight, this appears, perhaps, a little unbalanced; but in view of the developments of the last few years, it is essential that a subject of such moment should be dealt with in such a manner as to form a ready and permanent record. It is to be noted that even "Gas Warfare" takes its place among the articles, and though the treatment given to the subject is brief, it is in itself sufficient to indicate that the dictionary has not been "revised" as the word is frequently understood by some authors and publishers, but has been very largely re-written, and is as up-to-date as the interval between the receipt of manuscripts and final appearance could possibly permit. A very interesting table from Moureu's *La Chemie et la Guerre*, giving a list of the various toxic substances used by the Germans, with their physiological properties, is included.

This volume contains some hundred pages dealing with "Fuels and Gases," probably one of the most important technical phases of the day. The various branches are dealt with by experts in each sub-division, Professor Bone being responsible for fuel in general. This section would certainly have been improved had some of the later developments received more extended notice. For instance, half a column allotted to "powdered fuel" is not sufficient, and when one has purchased an exceptionally expensive reference book it is a little galling to be told that "for particulars of recent developments" *vide* something else. A careful search, moreover, does not indicate any allusion to colloidal fuels. The subject of towns' gas manufacture is by no means an easy one to condense even within the forty pages which Dr. H. G. Colman is allotted. The question must always arise as to whether a process in which engineering and chemistry play an equal part should be treated from the engineering or the chemical point of view.

This, however, is a dictionary of " applied chemistry," and Dr. Colman has, therefore, shown the correct leaning towards the chemical aspect. The late Professor Lewes still appears as the contributor of the article on " Oil Gas," but this has been revised since the previous edition, while the section previously contributed by Lewes on " Water Gas " has been re-written by Mr. Alwyne Meade.

In conclusion, it is due to Sir Edward Thorpe to say that there can be nothing but praise for the manner in which the material has been arranged, the discernment with which expert contributors have been selected, and the prodigious amount of work in which the new edition must have involved him. C. A.

AN INTRODUCTION TO THE PRINCIPLES OF PHYSICAL CHEMISTRY FROM THE STANDPOINT OF MODERN ATOMISTICS AND THERMODYNAMICS. By E. W. WASHBURN, Professor of Ceramic Chemistry at the University of Illinois. Second edition. New York: McGraw-Hill Book Co. Pp. 516. 20s.

The author in the preface to the first edition states that the book is designed for classes of students who propose to become professional chemists or physicists, but adds that it is written in such a manner that it can only be pursued to advantage by beginners under the direction of a competent instructor. This is certainly true, and the book is so exceedingly good and contains such a mass of material that it is a pity for the sake of a wider audience that in some directions the contents are not somewhat simplified. There are twenty-seven chapters as well as an appendix. Merely to give the contents of the various chapters would exceed the permissible length of a review, and it must suffice to state that there are very few aspects of physical chemistry which are not touched upon in the 500 pages of the book. In every chapter references are given to the leading original papers on the subject under discussion. A considerable number of problems are set, and in a number of cases reference is made to the results of such unsolved problems. The value of the work for the ordinary reader would be greatly increased if solutions to the problems were added as an appendix. A fairly complete subject index and author's index are included. The work is one to be highly commended. W. R. O.

INORGANIC CHEMISTRY. By T. MARTIN LOWRY, C.B.E., M.A., D.Sc., F.R.S. London: Macmillan and Co., Ltd. 1922. Pp. 940. 28s. net.

In reviewing a new book on an old subject, which is already represented by a score of treatises, one naturally expects to find some new features which have driven the author to commit himself to print. Perhaps the first thing which strikes the reader in turning over the pages is the excellence of the illustrations, especially the photographs of crystals, upon which the author may be congratulated. Furthermore, the very latest developments are touched upon—down to atomic radii, isotopes and the Lewis-Langmuir octet theory. The term " touched upon " fairly describes the method of treatment. There is little that goes to the rock bottom of the subject or deals with it in a really philosophic spirit. If we turn to Chapter XVIII we find in the opening statement " that under the influence of the electric current the salt undergoes electrolysis and is resolved into radicals of two kinds," etc. That statement is typical of how a subject is approached, the explanation being left to some subsequent paragraph, and in this way the book may be said to be largely didactic. The " Phase Rule " occupies about a page and we doubt very much if the account conveys any very clear idea of the subject or its use to the uninitiated student. Perhaps it is only fair to add that in the early part of the volume the less involved topics are treated in a more cautious manner and the explanations are then clear and concise. The historical references, too, are admirable, and are introduced in just the right places. I think the author, like many of his predecessors, has overlooked what I am inclined to think is the special feature of the phlogistic theory, which was not so much the escape of the matter of fire or sulphurous particles, an idea which was common long before Becker's and Stahl's day, but the transference of this matter from the phlogisticated to the non-phlogisticated substance, or, as we should call it to-day, oxidation and reduction. The same may be said of Black's contribution to chemistry. The notion of a gas forming part of a solid or losing its elasticity was repeatedly emphasised by Hales in his *Vegetable Staticks*. What Black added to that idea was the transference of the gas from one solid substance to another. It is not, I think, generally realised how fortunate was the circumstance that Black selected magnesium carbonate for his first experiments, a substance which loses carbon dioxide on heating and at the same time can be converted by calcium oxide into " a kind of quicklime," two properties which are not found combined in either sodium carbonate or calcium carbonate. To give effect to this view it is important to explain the behaviour of magnesium carbonate and then of the calcium salt, and not, as the author has done, to reverse the order. J. B. C.

SOAPS AND PROTEINS: THEIR COLLOID CHEMISTRY IN THEORY AND PRACTICE. By MARTIN H. FISCHER, with the collaboration of G. D. MCLAUGHLIN and MARIAN O. HOOKER. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1921. Pp. 272. 24s.

This book is a record of a very large number of experiments carried out with pure materials. The work is written in an exceedingly light and interesting manner, and although there will be found many who will not agree with the author's deductions the work itself will probably be of great interest to colloid chemists. The book is divided into four portions. Part I, which is much the fullest, deals with the physical nature of pure soaps in water, alcohol and other systems. Part II deals with the colloid chemistry of soap manufacture. Part III deals with the analogies between the behaviour of soaps regarded as colloids and protein derivatives and tissues. Part IV is an appendix of physico-chemical constants. Whether, in view of the large amount of work that has been done in this country on electrical conductivity of soap-water systems, the conclusions of Fischer will be accepted as doubtful. Many of the photographs are not very clear, and the material contained in the book could probably have been compressed, without much loss to the reader, into half the space. In spite of, or perhaps because of, the somewhat dogmatic point of view taken by the author, the work will doubtless be read with great interest by physiological chemists and by colloid chemists particularly interested in soap problems. W. R. O.

Incandescent Gas Mantles

THE Board of Trade have received a complaint by the Incandescent Mantle Manufacturers' Association that mantles for incandescent lighting manufactured in Germany are being sold or offered for sale in the United Kingdom at prices which, by reason of the depreciation in the value in relation to sterling of German currency, are below the prices at which similar goods can be profitably manufactured in the United Kingdom, and that by reason thereof employment in the incandescent mantle industry in the United Kingdom is being or is likely to be seriously affected. The Board of Trade Committee, consisting of Sir Bernard Mallet (chairman), Mr. J. Arthur Aiton, Sir John M. Barren, Mr. G. A. Moore and Mr. Arthur Pugh, will meet on May 31.

Safeguarding British Chemical Industries

Administration of the Dyestuffs Act

WHEN the House of Commons went into Committee on May 11, on a Vote of £729,545 for the salaries and expenses of the office of the Committee of Privy Council for Trade and Subordinate Departments, Mr. Baldwin gave a careful survey of the present condition of British trade and industry, in the course of which he said we had, undoubtedly, every prospect of recovering, retaining and improving the position we had always held. His forecast at the moment was that trade would continue the slow and gradual improvement which, he believed, had begun.

Captain Wedgwood Benn, in moving a reduction, criticised the Safeguarding of Industries Act and its administration, pointing out that Part I of the Act was passed on the distinct understanding that it was necessary to safeguard the military needs of this country; it was not a general measure of protection. Trade was hampered by delays under the Act, and we were encouraging foreign manufacturers at the expense of our own.

The Dyestuffs Position

Sir William Pearce said he was a member of the Committee set up in 1917 to consider our commercial and industrial policy after the war, and the schedule which was in question and the policy with regard to dyestuffs were the result of the recommendations made by that Committee. He did not want to attach too much consequence to what was done in 1917, because things had changed since, but this was not a party recommendation. It was a unanimous recommendation with regard to dyestuffs and the safeguarding of industries. The whole of the articles included in the Dyestuffs Act and the Safeguarding of Industries Act were carefully examined by the Balfour of Burleigh Committee, and there was no division of opinion in recommending the Government to safeguard these industries, not because they were only necessary for war purposes, but because they were required in times of peace for the industrial life of the country. It was because it was felt that these articles were almost entirely manufactured by our enemy countries and that there was no proper supply of them here, that the Balfour of Burleigh Committee made the recommendations which the Government finally embodied in the Dyestuffs Act and the Safeguarding of Industries Act. If the Government had not brought forward this legislation, the organic chemical industry of this country would have disappeared and there would be no dyestuffs industry and no fine chemical industry here. It would be quite impossible, in the present condition of the German industrial situation, for these industries to exist in this country unless they received the protection of these two Acts.

These two industries could only exist for the time being under protection, and they were absolutely necessary for the well-being of the country, not for war but for peace purposes. The policy of the House ought to be, not to destroy these industries, but to get rid of the inconveniences and the troublesome conditions with which they had to contend. In addition to the Free Trade party, there were two other very powerful interests who were naturally in opposition to this legislation—a certain section of the textile interests and the importers of foreign goods. Before the war, dyestuffs, which would not exist except for the policy of the Board of Trade, were imported into this country from abroad to the extent of from 80 to 90 per cent. of the dyestuffs used here. To-day the proportions were not quite reversed, but they were very nearly reversed, and so the policy of the Government had had a large success. There had been an enormous increase in the production of dyestuffs in this country.

German Point of View

Just before the Dyestuffs Act was passed, there had been a judgment under which the country was flooded with German productions. Then there was a big slump in the industry, and the dyestuffs and fine chemical industries had to meet a situation of unexampled difficulty. France had made, and Italy was thinking of making, an arrangement with the Germans in order to meet the position, as they were not fully prepared to cover it themselves; but he thought we were taking the best course, and that was why he was supporting the Government in their policy over these two Acts. We were in a different position from France and Italy. He had had to feel the pulse of the German chemical industry, and he heard himself a few months ago, and had it confirmed only a few days since, that the German chemical industry were taking quite a different view of this country from that which they were taking of France and Italy, and he pointed out that this policy was pretty well marked, even on the question of price. With regard to the manufactures in this country, the Germans quoted a very low price, but for the dyes they manufactured themselves, secure from competition, they quoted a very high price.

A Great Asset

This industry in Germany, continued Sir William, had been treated with the same precision as their military work was treated by the German General Staff, and to-day the whole of the German chemical industries were controlled by one Board. For the industry in this country to stand up against these forces, unaided, was quite impossible, and, therefore, the Balfour of Burleigh Committee was right in the recommendation it made to the Government, that, for the time being, some protection must be afforded to these two industries. The German view was that they could afford to wait, and that the dyestuffs industry and the fine chemical industry, without the encouragement of public opinion, would languish and finally would be destroyed, and we should be placed again in the position we were in before the war.

Anyone who read the German scientific papers would find that not only the big German syndicate controlling the chemical industries, but the German people and the German Government, had come to the conclusion that the organic chemical industry, including dyestuffs and fine chemicals, was one of the greatest assets they possessed. These were looked upon as being even more important than the steel trade, and they were looked upon as being important not only for to-day, but being of enormous consequence in relation to the future industrial development of the world; the same view was taken in America.

"No Redeeming Feature"

Speaking on the Dyestuffs Act, Mr. Fildes said he thought it was hopelessly bad. There was not a redeeming feature connected with it, in its present form. There was a great deal of difference between a 33⅓ per cent. duty and prohibition, but prohibition was the power conferred upon persons in authority in this country, under the Act. They had absolute power to prohibit certain dyestuffs coming into this country, and he contended that was a bad feature altogether.

There were, said Mr. Fildes, eight or nine very large users of indigo in Manchester, who combined for joint buying so that they might get the advantage of placing their orders in bulk and a corresponding reduction in price. These firms required a synthetic indigo paste. They wanted to buy 100 tons of this material, and the best quotation they could get from a British manufacturer was 1s. 9¾d. per pound for a hundred-ton contract, or 1s. 9d. a pound for a 500-ton contract. They could buy the same thing on the Continent for 1s. 0½d. per pound. On the annual consumption of this particular material, this difference in price made a difference to these eight firms alone of £84,000 a year. He would venture to say that for one person in the textile trade using colours and speaking in favour of this Act he would find 50 who condemned it root and branch.

Importation of Algol Red

Sir William Barton criticised the administration of the Dyestuffs Act, and, dealing with Mr. Vernon Clay's association with the Colour Users' Association and the British Dyestuffs Corporation, Ltd., wondered whether his reported resignation from the latter had anything to do with the administration of the Act. He mentioned the case of a firm which, though the dye supplied by the British Dyestuffs Corporation did not give the effect required, was refused a licence to import the

dye (Algol G5 Red) from Germany. The price of the German dye was 5s. a lb., and the British dye 16s. 3d. a lb. If the German price was an uneconomic price intended to injure the British dye industry, the refusal of the licence would have been justified, but he found that the pre-war price of the German dye was 1s. 0¾d. a lb., and that 5s. a lb. had been the price charged for 12 months. He had got a thoroughly capable chemist, undoubtedly one of the best men in the country, to dye for him from both these colours, using the same quantity in each case. Having dyed the same quantity with each, he reported that the colour cost of dyeing with the British dyestuff had been 106s., as compared with 37s. in the case of the German.

Sir William suggested that the establishment of some percentage, say, 15, 20, 30 or 40 per cent., within which the home producers must produce in order to retain their trade should be considered. It would be a good thing for them if they knew they must at least come within some fixed percentage of the foreign price, and it would be a great incentive to them.

Work of the Licensing Committee

Mr. W. J. U. Woolcock said, with regard to the prohibition of licences, that where a particular industry was suffering, probably prohibition was better than anything else. He was prepared to defend, not formally, as a member of the Licensing Committee, but wholeheartedly, the action of that Committee.

Dealing with the work of the Licensing Committee, Mr. Woolcock said it had been at work now for 15 months. It had had to consider over 5,000 applications for licences, and each application might consist of three, four or more qualities of dyes. There had been times when they had been very much slower than they would have liked to have been if they had had the facilities for going faster, and there had been times when they had gone very much slower than they should have done if the applicants had given them particulars which would have enabled them to come to a rapid judgment on the subject, or if, indeed, instead of the case being made to them that a particular red colour differed in shade from that put in the forefront and the Committee being asked to determine whether the shade was equal, they had been told right away that the question was one of price and not of colour. The Licensing Committee, therefore, had not only to judge as well as they could from what the applicant said, but sometimes from what the applicant did not say, as to the real grounds on which the application was made. Out of those 5,000 applications which had been dealt with, the Committee had recommended the granting of licences for 3,500,000 lb. of dyes, and had refused 2,500,000 lb. In terms of values, roughly, one and a third million pounds sterling had been granted, and £500,000 worth only refused. With regard to Mr. Vernon Clay, his latest information was that he was still a director of the British Dyestuffs' Corporation, although he was not occupying exactly the position on the managing committee of directors that he was.

The Onus of Proof

In the early days of the Dyestuffs Act the consumer accepted exactly the proof that he was placed in an unduly disadvantageous competitive position. The representatives of the Colour Users' Association accepted that onus of proof and had, as far as he knew, always admitted that the onus of proof with regard to price was based upon the colour user.

The Dyestuffs Act was being criticised by colour users, or a section of them, although the actual administration was in the hands of a Committee consisting of five colour users, three dyestuff makers, and three independent persons. It meant that if the five colour users had a case to bring before that committee, they had only to convince one out of the three independent members and they had a majority on the Licensing Committee, and could grant or refuse or do anything they liked. On the other hand, the dyestuff maker had to convince the whole of the three independent persons before he could get a majority to do anything on that Licensing Committee.

Solway Blue-Black

In regard to the question of price, continued Mr. Woolcock, there was a particular colour, which was called Solway blue-black, which the colour users of the country asked the dye makers to make here. The dye makers went to the colour users and said: "What is the next colour you want us to make?" and they were asked to make this blue black. They put down £50,000 or £60,000 worth of capital in order to make it. The German price at that moment was 17s. 6d. At the end of the second year, when the research work was over, the price fell to 15s. The dye makers were immediately ready to cut down the price, and they offered it to the colour users at 14s. 6d. The German price fell to 11s. 6d. at once. The British dye makers were anxious to make it as easy for the colour user as they could, and the British price was reduced to 9s. 9d. This could bear no relation whatever to the cost of manufacture, because there was over £50,000 sunk in plant. The total production that the country required was only 50 tons a year, and the total amount which the users had taken up to the present was 16 cwt. The German price to-day was 6s. 8d. It could be 4s. to-morrow. They would have no difficulty if it came down to 2s.

Mr. Baldwin's Reply

Replying to points raised, Mr. Baldwin said it would soon be time to review some of the effects of the Safeguarding of Industries Act, and the work of its Committees, and he would avail himself of the opportunity to see whether difficulties complained of could not be removed and more efficiency secured.

Safeguarding Act Criticised

House of Lords Debate

In the House of Lords, on Tuesday, Earl Beauchamp moved that "the Safeguarding of Industries Act interferes with trade and increases prices, and this House is of opinion that it should be repealed forthwith." It was, he said, almost inconceivable that out of £134,235 realised under the Act from October 1 last to March 25, no less than £54,000 had been paid by those who had been our Allies during the war. That showed how far the Bill failed in carrying out its ideals. A certain number of goods had been removed from the dutiable list, and it would be only common justice that the money collected from the importers of these goods should be returned to them. Dealing with the effect of the Act on trade, he complained of the way in which inquiries were conducted by the Board of Trade Committees. No questions might be put to any witness except by the Committee, the members of which were not connected with the trade and were at some disadvantage in putting questions on highly technical and abstruse points. As there was no cross-examination of witnesses, the evidence was of a somewhat partial character. He also complained of the way in which goods were held up at the ports.

The Marquess of Crewe drew attention to the interference that science and education encountered from the Act, and the manner in which the Act worked with regard to them.

Government Reply

Lord Gorell, in replying for the Government, said he could not agree that it had been proved that the Act was an experiment which had failed. Some critics said that the Act went much too far, and others that it did not go far enough. No order had yet been made under Part 2 of the Act. Roughly speaking, 100 different trades had entered into communication with the Board of Trade in connexion with that part of the Act, but not more than half of the total had reached the stage which could be regarded as formulating complaints. Seven reports had been made up to the end of March, and it was hoped that a decision upon them would be no longer delayed. Evidence at his disposal showed that the Act had, at any rate, done much to encourage manufacturers in this country, not only to hold on to the positions they had precariously won, but also to undertake new developments. Only in a very few cases had the passage of the Act resulted in increased prices, and there was, on the contrary, evidence that a number of chemical manufacturers had reduced their prices in order to take advantage of the Act and to increase their trade. That also applied to a certain number of scientific instruments and to scientific glass work. At the moment there were very few complaints of Customs delay, and in London there was no congestion at all.

Lord Buckmaster said that under the Act the most unjustifiable and one-sided form of protection was given that could be introduced.

On a division the motion was defeated by 36 votes to 34.

Oil and Colour Chemists' Association

Annual Meeting and Dinner

THE annual general meeting and dinner were held in London on Thursday, May 11, Dr. R. S. Morrell, the retiring President, being in the chair. After two small alterations to the Articles of Association had been made the Council's report for the year was presented.

Annual Report

The membership, the report stated, showed no material change, the total number being 196 as against 192 at the previous annual meeting. There were 79 London members, 103 provincial members, and 14 foreign members. The London members of Council retiring were Dr. J. N. Goldsmith, Mr. W. G. Aston and Mr. G. W. Dunster. The expenditure last year was £268, and the income £304. The balance on revenue account was £35 7s. 10d., and the capital account stood at £344 9s. 9d. The estimate for the coming year was an income of £208, and an expenditure of £220, and in view of these figures, the Council urged the need for increased membership.

Referring to industrial research, the Council regretted that no positive action seemed likely at present, a state of affairs which it regarded as very regrettable, as other industries were very active in that direction, and useful information and results were now forthcoming. The War Office Specification Committee had held but few meetings during the year, but a good deal of discussion had centred around Specification CWD. 283 for shell paints, and meetings had been held with Messrs. Elsden and Wilkinson, as representing the Directorate of Chemical Inspection. Mr. Wilkinson had conducted some specially good work in connection with mediums extracted from paints as supplied by the Committee, which should prove invaluable in the revision of this and similar specifications. Special thanks were recorded to Dr. Goldsmith for the many times he had placed his office at the disposal of the Committee.

On September 21, 1921, a conference was held with the Directorate of Chemical Inspection, Royal Arsenal, to consider how far it was possible to adopt the proposal of the Home Office that leadless paints should be adopted for supplies under the War Department. Mr. Palmer represented the Association and the general experience related was to the effect that for exterior work—taking all considerations into account, such as service, protection, and conditions of surface for repainting and for priming iron and steel—there was not sufficient evidence to justify the adoption of leadless paints, but for internal work it was possible to use suitably prepared paint which would meet the Home Office recommendations. Mr. Palmer said he could endorse what had been said regarding the use of leadless paints for exterior work and the priming of iron and steel. New white pigment paints were being proposed and investigated and at some future time a substitute for lead pigments might be found, but it was not possible, with the evidence at present available, to state that any of these newer pigments could efficiently replace white lead in paint for external work. In connection with the Home Office Committee on White Lead, Dr. Morrell gave evidence early in the year.

The Report also contained much information with regard to the work of the various sub-committees and panels of the British Engineering Standards Association, upon which the Oil and Colour Chemists' Association is represented.

Aircraft sub-committee 17 on chemicals has interested itself during the year in drafting a specification to provide an accurate yet simple and commercial method for the determination of the viscosity of a liquid in absolute units by comparison with a standard liquid the absolute viscosity of which was known. It was hoped that such a specification would be passed for publication during the year. The Sectional Committee on Chemical Engineering had held two meetings and had allocated the work to five sub-committees—viz., dimensional standardisation, materials of construction, mechanical handling and treatment of solids, mechanical handling of liquids and gases, and vessels and vats.

On the question of a Subject Group of the Society of Chemical Industry, discussions are proceeding between the Association, the Paint and Varnish Society, and the Society of Chemical Industry, and it was hoped to lay a concrete proposal before the members in the near future.

To allow of experimental work being carried out in connexion with papers read before the Association, the meetings next session will be held at the Birkbeck College Chemical Lecture Theatre, and thanks were recorded to the Governors of that Institute. Finally, Dr. Morrell expressed special thanks to Mr. Carwood, the hon. secretary and treasurer, not only for his work as such, but also for his work on the very large number of committees and sub-committees upon which he represents the Association. Thanks were also recorded to Dr. H. H. Morgan, the late editor of the Journal, and to Mr. T. Hedley Barry, the new editor.

MR. C. HARRISON, in moving the adoption of the report, referred to the great work done by Dr. Morrell for the Association, and proposed a vote of thanks to him and to the members of council and officers. MR. R. P. L. BRITTON seconded and the motion was carried.

Dr. MORRELL announced that the name of Dr. J. Newton Friend had been put forward as President for the coming year, and the proposal was carried unanimously. The following were elected Vice-Presidents :—Dr. H. H. Morgan, Dr. F. M. Perkin, Mr. Thornley, and Dr. R. S. Morrell. The new London members of the Council are Mr. Klein, Mr. Palmer and Mr. Tervet.

The following new rule was adopted :—" Any question involving the absorption of the Association by another Society, or affecting the independent existence of the Association, shall only be decided by a postal vote. A majority of not less than three fourths of the members voting shall be necessary to secure the alteration of status of the Association."

Speeches at the Dinner

Among those present at the annual dinner, which followed the annual general meeting, were Professor A.W. Porter, F.R.S., Dr. T. M. Lowry, Dr. Rudorf, Dr. Stephen Miall and Dr. F. M. Perkin, together with a large number of members and ladies.

A Plea for Separate Societies

Professor A. W. PORTER, proposing the toast of " The Oil and Colour Chemists' Association," said there were many objections to be urged to the indefinite multiplication of societies. There were the greater number of meetings to be held, the greater difficulty of keeping familiar with what was going on in the various societies, and there were other difficulties of finance, with which no doubt the Oil and Colour Chemists' Association was already familiar. Nevertheless, he thought the advantages of a separate corporation far outweighed the disadvantages. There was the advantage of having the specific questions with which they were concerned brought forward in a manner which might not be possible in a larger society, where only a small proportion of the members might be interested in any one problem. There might also be restrictions placed upon the possibilities of the questions that could be discussed. For these and other reasons he would strongly urge them, if at any time the question of sinking their individuality should be raised, to fight against that suggestion and keep separate as long as they possibly could. He was strongly in favour of specialist societies.

Dr. MORRELL, in reply to the toast, said that Professor Porter had given them some valuable information upon what would be a very important matter of policy within the next few months. It was not for him to offer any remarks that evening, but the next toast would be replied to by Dr. Miall, and it would be a great advantage to them to hear both sides of the question. He recently read in one of the journals representing the trade that chemists of the oil and colour industry were second rate. They might be, but the industry they represented was not. It was one of the oldest known. The effect of this great antiquity had been to make makers very conservative. There had been a tendency to drift into empiricism, and there might be some who thought that the introduction of the oil and colour chemist into the industry would make it too commonplace and even tend to make it

uninteresting. The lot of the oil and colour chemist was never a very happy one. His discoveries probably brought him no very great reward and they generally ruined his health. Nevertheless, the lot of the oil and colour chemist was very fascinating, however disappointing the results. He was sure they would all be glad to see some organised research in the industry. Perhaps he ought to say co-operative research, where everybody who was engaged in the industry would feel that he was getting something out of it, because some might feel that it was no use supporting a scheme which they were going to get nothing out of. When everybody could see that organised research would bring advantage to every individual, then he was sure organised research would come.

Dr. F. M. PERKIN proposed " The Visitors."

Dr. Miall on Fusion

Dr. STEPHEN MIALL, who replied, said he had been invited to the dinner not because he was renowned as a chemist or famous as an after-dinner orator but because he had been endeavouring to carry out some rather difficult negotiations in which the Association, the Paint and Varnish Society, and the Society of Chemical Industry were all concerned. It had been suggested to him that he might allude to the negotiations that were going on in regard to a possible fusion of the three bodies, but before he had had time to reflect how that could be the subject of an after-dinner speech, Professor Porter had got up and explained how advantageous it was for a society such as theirs to preserve its identity! All he would say was that the Society of Chemical Industry was very anxious to do everything it could which might be useful and acceptable to those in the paint and varnish industry. It was not possible for the Society, nor for him as its representative, to advocate that the Association should join the Society; it was not right that he should urge them to take any such step. The members of the Association were the best judges and the only judges of what best suited their interests and the advancement of the science which they had at heart.

A great many members of the Society of Chemical Industry were interested in the paint and varnish industry, and a great many of those members were also members of the Oil and Colour Chemists' Association or the Paint and Varnish Society, or both. All he could say was that if, after having considered the relative advantages of separate societies and some degree of fusion with the Society of Chemical Industry, they thought the Society of Chemical Industry could be helpful to the paint and varnish industry by disseminating scientific information about that industry, the Society would do all that it possibly could to help those who wished to make use of the advantages which it could put before them. It was the members of the Oil and Colour Chemists' Association, and they alone, who must decide whether or not they wished to have an entirely independent organisation or an organisation which in some degree formed part of the Society of Chemical Industry, and yet had an independence of its own, sufficient for the purposes and ambitions which the members held dear. That was the function of the Association itself, and he would be taking an unwarrantable liberty if he urged them to take one view or the other. He did not know the conditions sufficiently. What he felt was that a little goodwill and a little breadth of vision in looking at these problems would help to solve them in the way which would be most advantageous to the community. In scientific bodies they continually met with two discordant elements, the element which desired to split off and have a little organisation of its own, and the other element, which desired co-operation and to bring together bodies which had a good deal of common interest. Each case, however, must be judged on its merits, and it was impossible to lay down a general rule. Even if it were possible, that was neither the time nor the occasion to attempt such a thing.

The proceedings then closed.

Tests for Hydrogen Cyanide

As the result of experimental work at Pittsburgh by the Bureau of Mines small portable outfits for testing for hydrogen cyanide have been designed. One outfit is made to fit into a coat pocket, while another, which is about lunch box size, is intended to cover a larger range of tests. These outfits are now being tried in actual service by men engaged in fumigating for the United States Public Health Service.

Research Chemicals

To the Editor of THE CHEMICAL AGE.

SIR,—During recent years the thorny subject of chemical nomenclature and definition has become more than usually spiniferous. At the very outset we are faced with the questions—" What is a chemist ? " and " What is a chemical ? " and this is immediately followed up with questions as to the correct definition of organic, inorganic, fine chemical, and other terms. Now I find your esteemed and learned contemporary, *Nature*, asking by implication, " What is a research chemical ? " In its issue for May 6, on the subject of British Research Chemicals and the pamphlet thereon issued by the Association of British Chemical Manufacturers, *Nature* says : " This is a revised edition of the Association's earlier pamphlet, and now contains inorganic as well as organic chemicals. In the list of inorganic chemicals, however, there are many which cannot fairly be called research chemicals, and can be obtained from almost any dealer. These include alum, ammonium chloride, barium chloride, and the like. It is evident that the Association had research chemicals in mind in drawing up the list, since such substances as ferrous ammonium sulphate are omitted. This inclusion of common chemicals swells the bulk of the list without adding to its value."

For purposes of rough trade distinctions and classification it may be convenient to divide chemicals into common and research, into fine and heavy, or the like, but it is rather difficult to justify such distinctions on scientific grounds, or to know where to draw the line clearly. It is certainly not a scientific criterion for a research chemical to state that it is one which cannot be obtained from almost any dealer. " Research chemical " perhaps sounds a little more imposing than plain " chemical," and looks better as a title for a pamphlet. Otherwise there seems little point in trying to make a distinction where really there is very little or none. Research chemical may also imply a greater degree of purity, but here the difference is only in degree—a mere matter of relativity; and there is no need slavishly to follow German examples and necessarily to accept Merck's or Kahlbaum's criteria of " fine " or " research " chemicals. We have had enough of definitions and vague distinctions lately without trying to introduce any more.

In the Association's pamphlet it is pointed out that the manufacture of " new chemicals " may be undertaken by one or other of the firms according to demand, and in criticising this statement the writer in *Nature* says that the worker will not derive much comfort in being informed that the materials he requires cannot be made in this country because there do not happen to be a hundred other people working on the same subject. One ventures to think that this rather misses the real point, but in any case the main thing is for our manufacturers to be in a position to supply pure chemicals, so that we may be entirely independent of foreign sources, and I feel confident that if the research workers support the manufacturers, these latter will reciprocate.—Yours, &c.,

CHEMIST.

May 13, 1922.

Institution of Chemical Engineers

To the Editor of THE CHEMICAL AGE.

SIR,—With reference to your report of the inaugural meeting in London of the Institution of Chemical Engineers in your issue dated the 6th inst., I note that you state with reference to the financial position that the actual cash received was £606 12s. 9d. and that the disbursements were £433. Will you kindly note that the latter figure is incorrect, the actual disbursements for expenses being £152 8s. 11d., the figure of £433 being cash in hand and capital items?

I should be glad if you would kindly correct this, as otherwise a wrong impression with regard to expenses may be conveyed. —Yours, etc.,

F. H. ROGERS, Hon. Treasurer,
Proposed Institution of Chemical Engineers.

May 12.

British Glass Bottle Industry

Effects of Foreign Competition

A committee appointed by the Board of Trade under Part II. of the Safeguarding of Industries Act to consider a complaint with regard to the importation of glass bottles from Holland and Germany, began its sittings on Monday, May 15. The committee consists of Mr. C. A. Russell, K.C. (Chairman), Sir Cecil L. Budd, Mr. Owen Parker, Mr. E. W. Rainer, and Mr. James Rowan.

Sir Arthur Colefax, K.C., opened the case for the complainants, the Association of Glass Bottle Manufacturers of Great Britain and Ireland. The application, he said, was also supported by the Joint Industrial Council for the Glass Industry (Bottle Section), by certain other manufacturers' associations, and practically by the whole of the glass bottle manufacturers in the United Kingdom. Both masters and men supported the application, but there was opposition from the China and Glassware Section of the London Chamber of Commerce. The applicants asked that a duty of 33⅓ per cent. should be imposed upon empty bottles imported, and not upon bottles and their contents.

Mr. G. E. Alexander (Chairman of the Association of Glass Bottle Manufacturers and managing director of United Glass Bottles, Ltd.) emphasised the considerable amount of unemployment caused by the importation of German and Dutch glass bottles, and stated that the British glass bottle industry to-day was, owing to the vast improvements made, not to be compared with the industry in 1914. A very thorough investigation had been made in Germany and Holland by the Association, and the result was to show that if the exchanges were normal the prices of German bottles would be substantially higher than the corresponding British bottles. The manufacture of glass bottles in this country last year was carried on at a very heavy loss. It was pointed out that imports of glass bottles from Germany were 936,917 gross in 1913, and 330,349 in 1921, a considerable reduction, but the witness said it was the opinion of the Association that a large number of German bottles came through Holland.

Mr. R. S. Biram (general manager of E. M. Patents, Ltd.) said he had prepared the original statement of the case, and gave details as to the source of the information.

Mr. John Stokes (Secretary of the London Glass Blowers' Trade Society, and General Secretary of the National Federation of Glass Workers and Kindred Trade Unions) confirmed the statements that the importation of German and Dutch glass bottles had caused serious unemployment in the London glass bottle manufacturing industry. On April 22, 1922, there were 782 members of the London Society, of which 302 were unemployed. During the period in which it was difficult to obtain supplies from abroad the men were fully employed, but with the removal of restrictions and the increasing difference in the rates of exchange, unemployment set in. New methods of production had been introduced, which meant increased production, and many of the unemployed were being driven to the view that either there were too many in the trade, through having agreed to the Government request to dilute labour, or that they had produced too much and were idle in consequence. London was for many years the centre of the mall flint glass bottle trade, a class of work requiring great skill and speed on the part of the workers, but in spite of the fact that it was the lowest paid, this trade had steadily fallen off.

Mr. John Thompson (Secretary of the National Federation of Glass Bottle Workers of Great Britain and Ireland, General Secretary of the National Glass Workers Trade Protection Association, Chairman and Joint Secretary of the Joint Industrial Council for the Glass Trades, and a member of the Executive Committee of the International Federation of Glassworkers) also spoke of the serious unemployment caused by the importation of Dutch and German glass bottles. Only 49·30 per cent. of the working membership of the National Federation was at present employed. Many of the factories were at a complete standstill, and many more were only working 25 to 50 per cent. of their plant. He had recently visited Germany, and had found every glass bottle factory that could be manned by workmen fully employed. The wages of the bottle workers in Germany in 1914 were 27 marks per week on an average, but in February, 1922, when he visited the country, the average wages were 650 marks per week. Since February the mark had depreciated further, and a joint committee of employers and workmen met every three or four weeks to adjust wages according to the cost of living, which was rapidly increasing. At present the wages were from 1,000 to 1,200 marks per week, the latter being the maximum, and representing anything from 16s. to 19s. in English money. He believed that a duty on German and Dutch bottles would considerably improve employment in this country, for the reason that British manufacturers would then be able to compete with the German and Dutch manufacturers, which was at present impossible. More than 95 per cent. of the workers in the glass bottle industry supported the present complaint, and were of opinion that some measure of protection should be given the industry against the unequal and unfair competition that threatened its destruction. Thousands of our glass bottle workers were almost starving, and English manufacturers were compelled either to close down their plant altogether, or work a portion of it, which was done in most cases at considerable loss to the firms, besides the loss of employment to the workers.

The committee adjourned until Tuesday, May 23.

Optical and Scientific Instruments

The committee appointed by the Board of Trade to inquire into the complaint of British manufacturers of optical and other scientific instruments as to unfair German competition held its first sitting on Monday, May 15, under the chairmanship of Sir R. Henry Rew. The other members of the committee are Mr. A. K. Davies, Mr. Rayner Goddard, Mr. A. E. Holmes, and Mr. J. F. Mason. The basis of the complaint is that optical and other scientific instruments manufactured in Germany are being sold in the United Kingdom at prices which, by reason of depreciation in German currency, are below the prices at which similar goods can be profitably manufactured in this country, and that in consequence employment in the industry is being seriously affected. Sir Arthur Colefax appeared for the applicants, the British Optical Instrument Manufacturers' Association, the Spectacle Manufacturers' Association, and the Drawing Instrument Manufacturers' Association. Mr. E. Evans, M.P., appeared in opposition for a group of manufacturers and importers.

Mr. Watson Baker, representing the firm of William Watson and Sons, Ltd., manufacturers of prism binoculars, Holborn, said that although a duty of 33⅓ per cent. had been imposed upon imported microscopes, the prices of the German articles had been advanced by only 16⅔ per cent. They were hoping for an appreciation of the mark and an increase of wages in Germany. If this occurred a further duty of 33⅓ per cent. would greatly assist the British manufacturers.

Mr. A. J. Dennis, of the Houghton Butcher Manufacturing Camera Makers, said that the firm's sales were now about half what they were in 1914. In 1919 there was a great demand, and before German competition came in they could hardly cope with it. In 1913 their employees numbered 813, working 55 hours a week. The number increased to 1,260 in 1920, and had now declined to 379, working 47 hours a week. On equal trading terms, he believed they could beat the German product. If the German prices for cameras and binoculars were only 10 to 15 per cent. below our prices British manufacturers would get the business.

Mr. C. M. McGilchrist, of Ross, Ltd., makers of photographic lenses, binoculars, and optical instruments for the Admiralty and War Office, said they had as a key industry derived some benefit from the protection afforded under Part I. of the Act in force since last October. The help they now asked for would not of itself be sufficient to meet German competition. Regarding spectacle frames and mountings, it was stated that British manufacturers could meet German competition once the exchange was normal.

Mr. Thornton, managing director of A. G. Thornton, Ltd., makers of drawing instruments, said the British industry as regards machine-made articles had not yet attained manhood. They could meet German competition with the assistance of a 33⅓ per cent. duty. The Germans had a wider range of designs and patterns and the advantage of 50 years' experience.

The Committee adjourned until May 31.

April Trade Returns

Improving Export Trade in Chemicals

ACCORDING to the Board of Trade returns for April the expectations held out by the March figures are scarcely fulfilled. The upward movement in trade which characterised the returns for the first three months of the year has suffered a check, imports being £7,218,000 and exports £9,073,000 below the previous month's totals. The fall may be partly accounted for by the Easter holidays, and it is, at any rate, satisfactory that the improvement, as compared with the corresponding period of last year, is maintained. While the declared value of imports and exports was much lower than a year ago, the disparity is more than covered by the heavy fall in prices. Taking this fact into consideration a perusal of the figures shows that the actual volume of our trade has expanded considerably in the last twelve months.

Imports of chemicals, drugs, dyes and colours, at £943,405, were £111,306 less than in the preceding month and £84,874 more than in April 1921. Exports under this heading at £1,617,695 were £75,278 less than in March and only £30,500 less than in April of last year.

Imports of Chemicals

Dealing with quantities and making a comparison between April and March of this year, there is a slight increase in the import of potassium compounds and considerable decreases in nitrate of soda, borax and calcium carbide. One of the most interesting changes, however, is under cream of tartar, the imports of which have bounded from 4 cwt. to 794 cwt. within a month of the deletion of that commodity from the Safeguarding of Industries Act lists. Imports of cream of tartar in the corresponding months of 1921 and 1920 were, respectively, 1,679 cwt. and 3,204 cwt. The detailed figures in cwts., unless otherwise stated, are given below with the March figures in parentheses. INCREASES: Acetic acid, including acetic anhydride, 270 tons (218); tartaric acid, including tartrates not elsewhere specified, 1,664 (502); crude glycerine, 3,342 (2,602); potassium nitrate, 18,367 (13,312); potassium compounds other than nitrate, 559,638 (519,448); sodium compounds other than nitrate, 12,672 (11,505); and cream of tartar, 794 (4). DECREASES: Bleaching materials, 1,586 (1,985); borax, 2,505 (6,427); calcium carbide, 29,554 (60,492); distilled glycerine, 438 (682); red lead and orange lead, 1,301 (1,712); sodium nitrate, 8,120 (62,178); and zinc oxide, 396 tons (455).

Improvement in Sodium Compounds

Although there are not many very large increases to be noted in the month's exports there is an encouraging recovery in sodium compounds, the total being 35,239 cwt. more than that of the previous month. Potassium compounds, too, show a considerable increase. The brisk recovery in tar oil, creosote, etc., recorded last month has gone down again by nearly 50 per cent., although the figure compares fairly well with the quantities exported in the corresponding months of 1920 and 1921. There was a large decrease in our exports of sulphuric acid, while the total for sulphate of ammonia has fallen by 3,917 tons. The following figures show in detail the products the April exports of which were larger than in the preceding month; the March figures are given in parentheses, and the amounts are in cwts. unless otherwise stated:—Ammonia chloride (muriate), 584 tons (287); bleaching powder, 16,854 (16,078); benzol and toluol, 13,316 galls. (7,120); carbolic acid, 12,409 (8,655); naphtha, 7,276 galls. (2,054); naphthalene, 1,713 (1,003); coal tar products not elsewhere specified, 30,447 (27,563); copper sulphate, 7,691 tons (6,664); distilled glycerine, 1,110 (815); potassium nitrate, British prepared, 1,653 (1,509); potassium compounds other than nitrate and chromate and bichromate, 12,759 (1,127); sodium carbonate (including soda crystals, soda ash, and bicarbonate), 340,516 (327,563); caustic soda, 133,210 (110,598); sodium chromate and bichromate, 2,925 (1,989); and sodium sulphate (including saltcake), 50,167 (45,724). The decreases, similarly compared, are: Sulphuric acid, 998 (8,138); tartaric acid, including tartrates not elsewhere specified, 278 (443); ammonium sulphate, 8,951 tons (12,868); tar oil, creosote, etc., 1,370,954 galls. (2,608,226); crude glycerine, 1,029 (1,058); potassium chromate and bichromate, 1,471 (1,973); sodium compounds not elsewhere specified, 30,867 (36,572); and zinc oxide, 237 tons (249). There were no exports of anthracene during the month and the total quantity exported this year was 20 cwt., exported in January.

Dyes and Dyestuffs

As in previous months this year, there were no imports of coal tar dyestuffs during April and there was an all-round decrease in imports of dyes and dye-extracts. The total quantity of finished dyestuffs imported during the month under review was 2,872 cwt., as against 3,479 in March and 7,600 in April, 1920. The comparative figures for April and March this year are: Alizarine, 105 (107); finished coal tar dyestuffs other than alizarine and synthetic indigo, 2,767 (3,363); cutch, 3,413 (4,875); extracts for dyeing, all other sorts, 3,849 (12,242); natural indigo, 107 (163); and tanning extracts, 83,163 (115,112).

Exports of dyes and dyestuffs were greater as to quantity although the value was smaller than in March. The total of 8,485 cwt. (as against 7,222 in March) made up of 4,354 cwt. of coal tar products and 4,131 cwt. of other sorts, was valued at £32,117, while the previous month's exports amounted in value to £50,090.

Imports of painters' colours and materials continue to increase, while exports, generally, are slightly down. The comparative figures are: IMPORTS: Barytes, ground (including blanc fixe) 64,575 (42,471); white lead (basic carbonate), 10,541 (7,756); and painters' colours and materials, other sorts, 45,711 (41,260). EXPORTS: Barytes, ground (including blanc fixe), 4,065 (8,172); white lead, 11,773 (18,397); paints and colours, ground in oil or water, 22,251 (17,486); paints and enamels, prepared (including ready mixed), 14,850 (14,593); and painters' colours and materials, other sorts, 47,417 (44,488).

Scientific Instruments and Glassware

Scientific glassware (except tubing and rod) was imported to the value of £6,181 against £4,903 in March, while 177 cwt. of glass tubing and rod valued at £735 was imported as compared with 247 cwt. of the value of £1,301 imported in the previous month. Exports of tubing and rod totalled 77 cwt., worth £601, against 47 cwt., of the value of £478, shipped in March. We imported 119,137 gross of glass bottles and jars as against 101,187 gross, and exported 22,385 gross, as compared with 24,823 gross. Scientific instruments and appliances (except electrical) were imported to the value of £57,536 against £38,267, while the exports under this heading totalled £75,934 as against £180,128.

Coal exports were 1,104,657 tons less at 4,096,578 tons, and were worth £4,650,455 as compared with £5,785,310.

Damages for Breach of Soap Contract

IN the Mayor's and City of London Court, on May 12, a claim was made by Mr. R. A. O. Taylor, 52, Queen Victoria Street, London, against the Cheapside Commercial Agency, 14, Cheapside, London, for £1,800 damages for breach of a soap contract. The plaintiff said he was informed in February last that the defendants had a parcel of soap for sale and they knew he was desirous of reselling it. He received a $4\frac{3}{4}$ oz. sample of soap. On February 8 he received a firm confirmation of an offer of the soap from the defendants at 15s. 6d. per gross ex-wharf London. On February 9 he wrote accepting, but before writing he telephoned inquiring whether there was any mistake and that the sample as delivered was correct as to size, quality and weight. He was informed it was all correct and he said he would take up the contract and send a confirmation along. He had contracted to resell the soap at 18s. per gross, or a difference of 2s. 6d. per gross. The defendants failed to deliver the soap and had said they were unable to do so. He had been pressed by a customer for delivery and he knew that his customer had resold the soap at 20s. per gross. He had been threatened by his customer's solicitor with proceedings, and so far as he knew he was liable to his customer. The amount of damages claimed by the customer was £800. There was no appearance on behalf of the defendants and judgment was given for the plaintiff for £1,800.

Chemicals in Relation to Fabrics

Launderers Discuss Dyes and Research

Over three hundred delegates assembled in Edinburgh last week to attend the Fifth Annual Congress of the National Federation of Launderers.

MR. R. G. PARKER, B.Sc., Director of the British Launderers' Research Association, dealt with the colour problem, washing material, and detergents. He referred to the use of the Lovibond tintometer which, he said, would help launderers in their analysis of tints, and spoke of the success of this instrument in the analysis of cottonseed oil, petroleum, white lead and household flour. He advocated the adoption of a standard means of comparing colour qualities. Mr. Parker referred to impurities in washing materials, which, he said, were of prime importance to launderers. On them or their absence depended to a very large extent the strength and content of the detergent. Soaps too, were a subject for investigation. Those already on the market must be analysed, and their action, as well as the action of their individual constituents on fabrics, must be systematically studied. Research must be set on foot with a view to discovering new detergents, and when discovered their commercial suitability must be investigated.

MR. E. H. MARSH read a paper on "Some Chemical Mysteries of the Washhouse," in which he referred to the solubility of albumenoids, the emulsification of greases and raw materials used as agents, such as alcohol, naphtha, carbon tetrachloride, etc. After referring to the action of calcium, which he said was highly undesirable in the water used in laundries, the lecturer said that alkali was injurious to silk and not particularly beneficial to cotton and flax. At boiling temperature it would dissolve some greases by turning them into soluble soaps, but it would not emulsify any. Its function was to remove the metals which formed lime soap; this action should occur in the water-softening apparatus. As long as water was soft, continued Mr. Marsh, the minimum amount of soda should be used. Salts of iron being insoluble in water caused iron-mould. The problem was to find a substance which would form a soluble compound with iron, but would not damage the fabric.

The fastness of dyestuffs was gone into by MR. J. E. SHAW, who read a paper on "Fast Colours used in the Manufacture of Coloured Cotton Goods." He said the standard of fastness varied considerably in different cloths, but was considerably higher to-day than at any other time. A colour considered fast a few years ago was not considered so to-day. This was the result of the discovery of vat colours. Colours varied so much in their fastness to washing, light, chlorine, etc., that it was often necessary to use a colour, because of its fastness in one respect, where this fastness was particularly required, knowing that at the same time it lacked in fastness in other respects. In a case where the cloth was exposed to light and weather the colour must first of all withstand this exposure and would be used even if its fastness to washing was not all that could be desired, as in the case of tapestry and casement cloths. A colour of perfect fastness to light, weather, and washing, no matter how severe, giving perfect penetration in dyeing, which would not rub or mark off when friction was applied, and would also go through a bleaching process without change was very difficult to find. Personally he could not name one which had not some weak points. For the manufacture of coloured cotton goods it was necessary that the colour should withstand a bleaching process and for this purpose a limited range of colours such as turkey red, indigo blue, aniline black, etc., were used. With the introduction of indanthrene and other vat colours along with a modified method of bleaching, the range of colouring matters and cloths was widened. He also pointed out that the colour which would withstand bleaching in the piece would withstand treatmentin the laundry.

Mr. Shaw then described the various processes of manufacture in order to demonstrate the treatment to which a colour was subjected when used in cloths. The yarn was first dyed and introduced into the warp or weft. The cloth was then bleached by boiling with soap and soda solution (without pressure), washing, bleaching with chloride of lime solution, washing, treatment with acid, washing, and very often the whole process repeated. The cloth was then dried and finished. To undergo this treatment successfully it was essential that a colour should not bleed or stain the white, that it should be fast to boiling soap and soda solution, and should also withstand a bleaching with chloride of lime solution without unduly reducing the depth of the shade.

Supplies of Laboratory Materials

To the Editor of THE CHEMICAL AGE.

SIR,—From time to time complaints have been made in the Press and received at the offices of this Union against the operation of the Safeguarding of Industries Act, 1921. It has been asserted that the Act greatly increases the running cost of laboratories, which are still, to some extent, dependent upon other countries for supplies of scientific apparatus, laboratory ware and fine chemicals; and this increased cost has fallen upon research and teaching institutions at a time when the Government is restricting grants. In consequence of the complaints received, this Union approached the British Medical Association, and a joint committee of the two organisations was formed, with the view of exploring the ground and making representations in the proper quarters. If sufficient information is forthcoming, it is the intention of these two Associations to arrange for a deputation to wait upon the Rt. Hon. H. A. L. Fisher, Minister of Education, following upon the suggestion made by Viscount Peel in the House of Lords on November 10 last. It is intended that this deputation should be representative of all scientific and educational bodies, and we are already assured of the support of some of them.

A letter has been addressed to the Deans of the Faculties of Science and Medicine of all British Universities and University Colleges, to Deans of Medical Schools, to Principals of Technical and Agricultural Colleges, and to the Institutes of Physics and Chemistry, and the various teachers' associations. This has asked for information under the five following headings:—

"1. The difficulties experienced by members of your" [University, society, etc.] "in obtaining British materials and laboratory ware of the requisite quality and quantity.

"2. The difficulties experienced in obtaining British scientific instruments.

"3. Detailed particulars of instances where difficulties and delays have been experienced through the action of the customs authorities in obtaining consignments from abroad.

"4. The increase in the running costs of laboratories which can be directly attributed to the operation of the Act.

"5. Details of cases where researches have been hindered or had to be definitely abandoned owing to the difficulties of obtaining materials from abroad or their excessive cost in this country."

A fair number of replies has been received, though in many cases the information given is not in sufficient detail. I should be glad, therefore, if all scientific workers, including those engaged in industry, would supply me with detailed information under these five headings at the first opportunity.

—Yours, etc.,

A. G. CHURCH,
General Secretary.

National Union of Scientific Workers,
25, Victoria Street, Westminster.
May 17, 1922.

Sir Thomas Holland's New Post

SIR THOMAS HENRY HOLLAND has accepted the invitation of the Governing Body of the Imperial College of Science and Technology, South Kensington, London, to be Rector as from September 1 next, in succession to Sir Alfred Keogh, who is retiring under the age limit. A former student at the Royal College of Science, Sir Thomas Holland was at the age of twenty-one appointed Berkeley Fellow of Owens College, Manchester, in 1889. In the following year he went to India on the Geological Survey, and in thirteen years rose to the Directorship. He returned to this country in 1909 as Professor of Geology in Manchester University. He was appointed President of the Indian Industrial Commission in 1916 and presided over the Indian Munitions Board from 1917 to 1919. Resigning from the Board last year, Sir Thomas returned to England to resume the work which he was doing up to the outbreak of the war as scientific consultant to important British Corporations operating in various parts of the world.

Chemical Matters in Parliament

Duty on Spirits

Mr. Lyle (House of Commons, May 11) asked the Chancellor of the Exchequer if he was aware that the present duty of 74s. per proof gallon on perfumery was crippling the industry; whether he would consider the question of separating the perfumery trade from the potable spirits industry and a lower and different duty for the trade; and, if this was not possible, whether he could see his way to amend the existing law to permit of perfumery being manufactured in bond for home trade, and to enable manufacturers to mature the spirit in bond and so release capital.

Sir R. Horne said he was aware that representations had been made in the sense mentioned by Mr. Lyle, but he was unable to adopt either of his suggestions.

Safety-lamp Glasses

In reply to Major Barnes (House of Commons, May 11), Sir R. Horne said no financial assistance had been given to any of the firms engaged in the production of safety-lamps for use in coal mines, and in regard to Excess Profits Duty only such allowances had been given as were authorised by the statutes relating to that duty which were applicable to trades and businesses in general.

Opening of Packages

Sir W. Mitchell-Thomson (House of Commons, May 11) informed Mr. Kiley that the Post Office charge for the opening and re-packing of any individual parcel inspected under the Safeguarding of Industries Act was 6d.

Radium Bromide

In reply to Lieut.-Colonel Guinness (House of Commons, May 15), Mr. Baldwin said that radium bromide was now subject to an import duty under the Safeguarding of Industries Act. He had no power to take steps to remit this duty in the case of all radium for therapeutic purposes.

Safeguarding Act Panel

In reply to Mrs. Wintringham (House of Commons, May 15) Mr. Baldwin said that so far as it was possible to judge, it was unlikely that any further additions to the permanent panel under Part II. of the Safeguarding of Industries Act would be necessary for the present. The great majority of the panel already consisted of persons of commercial or industrial experience.

Revenue under Section 1

Answering Mr. Holmes (House of Commons, May 15), Mr. Young said the amount of Key Industry Duty collected in respect of articles held by the referee to have been improperly included in the lists issued by the Board of Trade under Sub-section (5) of Section 1 of the Safeguarding of Industries Act amounted to £10,249. This sub-section provided that, where an article was held to have been improperly included, the amendment of the lists would be without prejudice to the validity of anything previously done thereunder. The duty so paid was not, therefore, repayable.

Synthetic Camphor

Mr. Baldwin stated in reply to Mr. Hogge (House of Commons, May 15) that the formal notice of objection in regard to synthetic camphor was served by the complainants on December 28. The necessary statements by both sides were completed by March 28 and the hearing was opened on April 1. Further proceedings were delayed by the illness of the referee until April 29, when the second and final hearing took place. He had no doubt the decision would be given as soon as possible. He fully appreciated the desirability of avoiding delay, and there had been no avoidable delay by the Board of Trade in this case.

Gretna Factory

Replying to questions by Major C. Lowther and Mr. A. M. Samuel (House of Commons, May 15), Mr. Young said that no offer by a syndicate to buy the Government factory at Gretna upon an independent valuation nor any offer for the estate with payment of the purchase money upon completion had ever been made. The only offers which had been received were wholly unacceptable, not only because of the inadequacy of the amount, but also because of the terms asked for in respect of deferred payment. Those who had been in negotiation had expressed disapproval of what they apparently believed to be the Government valuation, although the amount of this had not been disclosed. The Government were prepared to give immediate consideration to any offer to buy this property at a price to be fixed by independent valuers of repute to be agreed upon, provided the offer came from responsible people, and upon terms of payment which could be approved.

Key Industries Complaints

Mr. Holmes (House of Commons, May 15) asked the President of the Board of Trade how many applications under Part I of the Safeguarding of Industries Act had been heard by the referee; and in how many cases had the referee held that the article, the subject of the complaint, had been improperly included in the Schedule of dutiable articles?

Mr. Baldwin said the answer to the first part of the question was thirteen, but in two cases judgment had not yet been given. The answer to the second part was five.

Major M. Wood (House of Commons, May 15) asked the President of the Board of Trade whether he was aware that many chemicals had been removed from the list of articles dutiable under Part I. of the Safeguarding of Industries Act after the duty had been paid, and that as the result of this importers had been left with large stocks on which they could not obtain return of the duty paid; and whether he proposed to introduce legislation to enable him to repay the duty in cases where the referee decided that, owing to the action of the Board of Trade, the duty was improperly exacted?

Mr. Baldwin said a number of items had been removed from the list; he was not aware what stocks of these were now held by importers; the answer to the last part of the question was in the negative.

Sodium Pyrophosphate

Dr. Murray (House of Commons, May 15) asked the President of the Board of Trade (1) if he was aware that sodium pyrophosphate (cream of tartar substitute) was still retained in the key list under Part I. of the Safeguarding of Industries Act, 1921, although the recent decisions of the referee on points of principle in connexion with the cream of tartar appeal definitely ruled that its inclusion was improper; and if he would take steps to have this product, with some hundreds of others that were equally affected, removed from the key list without delay; (2) if he was aware that the referee's decisions on points of principle already given in connexion with appeals against the inclusion of certain products in the key list under Part I. of the Safeguarding of Industries Act, 1921, had only been applied to products against which formal notice of appeal had been lodged by their deletion from the key list, and that a number of other products against which formal notice of appeal had not been lodged, but which were equally affected by the referee's rulings, were still retained in the key list; and whether he would order the immediate removal from the list of all such products.

Mr. Baldwin said that for the purpose of reducing the number of cases to be heard by the referee, he had examined the views he had expressed in awards already given in their bearing on the complaints not yet heard. As a result, certain amendments of the lists issued under Section 1 (5) of the Act had been made. Sodium pyrophosphate had not been the subject of any formal complaint within the terms of Section 1 (5), and was accordingly outside the scope of his review.

Scientific Instruments and Appliances

Sir R. Horne (House of Commons, May 16) gave Dr. Murray the following particulars of the amount of duty collected under the Safeguarding of Industries Act for the six months ending March 31 last: Scientific instruments and appliances of various kinds (except electrical and optical), £111; optical instruments and appliances, £20,897; precision balances £1,271; and gauges, £1,165.

Lower Railway Rates

THE English and Welsh railway companies announce further reductions in rates for the carriage of merchandise, to come into operation on May 22. The goods affected include coal, coke, and patent fuel; iron ore, ironstone and limestone; burnt iron pyrites, manganiferous iron ore; purple ore; manure in bulk; chrome iron ore; manganese ore; lime for iron and steel making; calcined dolomite limestone; ferro-silicon, silico manganese; and basic slag and lime in bulk.

From Week to Week

Our American contemporary, *Chemical Age*, announces the removal of its NEW YORK OFFICES to 381, Fourth Avenue.

FREDERICK BOEHM, LTD., of 15–17, Jewry Street, London, have removed their American offices to 53, Park Place, New York.

MR. ALBERT JAMES MOORE, managing director of the Langloan Iron and Chemical Co., Ltd., died at his residence at Brookland, Langloan, Coatbridge, on May 16.

The death occurred on Tuesday, after a long illness, of Brig.-General F. M. Carleton, chairman of the Peru Syndicate, and a director of the Chile Syndicate, and other companies.

The death is announced, at the age of 65, of MR. W. MCKUNE MARGERISON, who was for many years a partner in the firm of J. Margerison and Co., soap manufacturers, of Preston.

The Progress Medal of the Royal Photographic Society has been awarded to MR. F. F. RENWICK for his research in the chemistry and physics of photography.

MR. JOHN CUREDALE, J.P., of Prentice Brothers, Ltd., chemical manufacturers, Stowmarket, is the newly-elected chairman of the Ramsey Urban District Council.

At a meeting of the Council of the University College of South Wales and Monmouthshire at Cardiff on May 12, a DIPLOMA IN METALLURGY was awarded to Mr. L. P. Thomas.

CONSIDERABLE DAMAGE was caused by fire on Tuesday at the premises of Werringham & Co., oil distillers and refiners, Blackhorse Road, Deptford, London.

DR. E. HENDRICK, of New York, will act as the official representative of the American Section of the Society of Chemical Industry at the forthcoming annual meeting in Glasgow.

THE FLEETWOOD CHEMICAL COMPANY, LTD., announce the removal of their offices from St. Dunstan's Buildings, St. Dunstan's Hill, London, to 9, Prince Street, Deptford, London.

According to reports from Berlin, a group of German metal firms has concluded an agreement with the Styrian Magnesite Industry Co., of Vienna, whereby the company's OUTPUT OF CAUSTIC MAGNESITE is secured to Germany.

Antimony ore from the Costerfield Mine, Victoria, is, it is reported, being used by the Antox Syndicate, Ltd., of Sydney, Australia, for the manufacture of oxide of antimony for use as a SUBSTITUTE FOR WHITE LEAD.

At a meeting of the Edinburgh University Court on Monday the following examiners were appointed for theses for the DEGREE OF D.SC.: Professor F. G. Hopkins, Professor Baily, Dr. S. Brodelsky, Professor G. H. F. Nutall, Professor W. Somerville, Professor Biffen, and Dr. E. J. Russell.

DR. ROBERT ROBINSON, F.R.S., Professor of Chemistry in the University of St. Andrews, has been appointed to the chair of Organic Chemistry at Manchester University. It is expected that Dr. Robinson will enter on his duties at the end of the Lent term of next session.

MR. J. W. BISPHAM, M.A., B.Sc., of the London County Council Service (Technology Section), has been appointed principal of the Borough Polytechnic Institute, to fill the vacancy caused by the retirement of Principal C. T. Millis. He will take up his duties in September.

Applications are invited by the Salters' Institute of Industrial Chemistry, Salters' Hall, St. Swithin's Lane, London, for a LIMITED NUMBER OF FELLOWSHIPS, each of the annual value of £250, falling vacant in October next. Applications, with full particulars of training and experience must reach the Director of the Institute by June 10.

A sample of the oil from the newly-discovered station at Darcy has been subjected to PRELIMINARY ANALYSIS by Mr. J. E. Hackford. This analysis shows that the specific gravity, at 60° Fahr., is ·819, and that the oil contains 15 per cent. of gasoline, 25 per cent. of kerosene, 35 per cent. of gas oil, and 25 per cent. of lubricating oil. It has a paraffin base.

On Thursday, May 11, a light thrown down caused a fire at 41, West Lane, Bermondsey, premises occupied by RAOUL FRERES, chemical merchants. It is a building of one and three floors, about 40 ft. by 30 ft., used as stores, and about one-half of the ground floor, and the contents, were damaged by fire. The rest of the ground floor, and the upper part of the building, and the contents, suffered from heat, smoke and water.

THE BRITISH ASSOCIATION announces the publication, early next month, of "The British Association: A Retrospect, 1831–1921," by the secretary of the Association, Mr. O. J. R. Howarth, which will present a summary review of the activities of the Association in every department of science since its foundation. The production of this volume has been rendered possible through the generosity of the Hon. Sir Charles Parsons, ex-president, at whose suggestion it was undertaken.

Among the passengers by the *Adriatic*, which left the Mersey on May 13, was COLONEL GEORGE E. S. SMITH, a director of Nobel Industries, Ltd., who is proceeding on a business tour of the States. Colonel Smith observed that there was undoubtedly a distinct upward tendency in world trade, but that nothing approaching a boom would be possible until the countries of Europe came to an agreement on the question of rates of exchange. At present commercial magnates were stepping along cloudy avenues, and the going was perforce difficult and slow.

With reference to the previous notice stating the terms of reference to the Optical and Other Scientific Instruments Committee, the Board of Trade give notice that OPTICAL ELEMENTS, whether finished or not, manufactured in Germany, shall be included in the terms of reference to the Committee. The Committee propose to hold their first sitting for the taking of evidence in regard to optical elements at 11 a.m. on Wednesday, May 31, at the Hotel Windsor (Mines Department), Victoria Street, London. The secretary is Mr. T. Turner, Board of Trade, Great George Street, London, to whom all communications should be addressed.

We regret to record the death, at the age of 73 years, of PROFESSOR HENRY MARION HOWE, a distinguished American metallurgist. Graduating at Harvard in 1869 and at the Massachusetts Institute of Technology in 1871, he was appointed Professor of Metallurgy at Columbia College, New York, in 1897. He had received the Bessemer Medal of the Iron and Steel Institute, of which he was an honorary vice-president, and was awarded the John Fritz medal in 1917. He was the author of a number of books on metals, and played a prominent part in the introduction and development of manganese steel in the United States of America.

At the annual dinner of the Pharmaceutical Society, held in London on Tuesday, the Home Secretary (Mr. Shortt) referred to past differences between his department and the society in regard to the Dangerous Drugs Regulations, and said that if they had not got those regulations through when they did, they would have had far worse regulations than the Home Office gave them. The chairman (Mr. E. T. Neathercoat) stated that next year they proposed to hold a great English conference of pharmacists at the same time as the holding of the International Pharmaceutical Federation meeting, and they had invited the latter body to a joint conference at which they hoped to bring about some uniformity in pharmaceutical practice throughout the world. The toast of "The Guests" was proposed by Mr. C. A. Hill (British Drug Houses, Ltd.).

A CONVERSAZIONE was given by the Royal Society at Burlington House, London, on Wednesday, when the guests were received by the President, Sir Charles Sherrington. Sir William Bragg and Professor W. L. Bragg illustrated their explorations into crystal structure with the aid of X-rays by a number of models of inorganic crystals, such as arsenic, diamond, and graphite, and corundum (ruby and sapphire), and also of organic substances like naphthalene. Professor H. B. Baker showed the apparatus with which he has been investigating the effects of long drying on the boiling points of liquids. By exposing mercury, benzene, bromine, and other substances to the action of phosphorous pentoxide for periods of seven to nine years he has found a rise in their boiling points varying from 26° to 62°. Among those present were Sir J. J. Thomson, Sir T. Holland, Sir G. Beilby, Sir R. Robertson, Sir Dugald Clerk, and Sir Herbert Jackson.

References to Current Literature

British

CATALYSIS.—The catalytic activity of copper. Part III. W. G. Palmer. *Roy. Soc. Proc.*, May, 1922, pp. 175–186.

DRYING.—Change of properties of substances on drying. H. B. Baker. *Chem. Soc. Trans.*, April, 1922, pp. 568-574.

KETONES.—Piperitone. Part II. Benzylidene-*dl*-piperitone. J. Read and H. G. Smith. *Chem. Soc. Trans.*, April, 1922, pp. 574–582.

Piperitone. Part III. The oximes of *dl*-piperitone. J. Read, H. G. Smith and M. Bentivoglio. *Chem. Soc. Trans.*, April, 1922, pp. 582-593.

OPTICALLY ACTIVE COMPOUNDS.—The molecular configurations of polynuclear aromatic compounds. Part I. The resolution of *y*-6 : 6′-dinitro- and 4 : 6 : 4′ : 6′-tetranitro-diphenic acids into optically active components. G. H. Christie and J. Kenner. *Chem. Soc. Trans.*, April, 1922, pp. 614–620.

CATECHIN.—The constitution of catechin. Part IV. M. Nierenstein. *Chem. Soc. Trans.*, April, 1922, pp. 604–613.

AMMONIUM NITRATE.—The decomposition of ammonium nitrate by heat. H. L. Saunders. *Chem. Soc. Trans.*, April, 1922, pp. 698–711.

SYSTEMS.—The 25°-isotherms of the systems magnesium nitrate-sodium nitrate-water and magnesium sulphate-magnesium nitrate-water. D. N. Jackman and A. Browne. *Chem. Soc. Trans.*, April, 1922, pp. 694–697.

ELEMENTS.—Artificial disintegration of the elements. E. Rutherford. *Nature ;* Part I., May 6, 1922, pp. 584–586 ; Part II., May 13, 1922, pp. 614–617.

United States

CATALYSIS.—Catalytic preparation of azobenzene and aniline; C. O. Henke and O. W. Brown. *J. Phys. Chem.*, April, 1922, pp. 324–348.

HYDROGENATION.—The hydrogenation of naphthalene. R. G. Furness. *Chem. Age* (N. York), April, 1922, pp. 173–176.

ISINGLASS.—Isinglass : its sources, manufacture, composition, properties, adulteration and uses. H. H. Bogue. *Chem. Age* (N. York), April, 1922, pp. 183–184.

FOODSTUFFS.—Biscuit and cake manufacture. W. Platt. *Chem. Age* (N. York), April, 1922, pp. 157–160.

VALENCY.—The nature of secondary valence. Part VI. H. W. Smith. *J. Phys. Chem.*, April, 1922, pp. 349–357.

DYEING.—Dyeing of deaminated wool. W. W. Paddon. *J. Phys. Chem.*, April, 1922, pp. 384–389.

FURFURAL.—The system furfural-water. Part II. G. H. Mains. *Chem. and Met. Eng.*, May 3, 1922, pp. 841–843.

GENERAL.—Handling the finished products of industry. Part I. G. L. Montgomery. *Chem. and Met. Eng.*, May 3, 1922, pp. 823–825.

WATER.—Some facts about residual alum in filtered water. A. M. Buswell and G. P. Edwards. *Chem. and Met. Eng.*, May 3, 1922, pp. 826–829.

ACIDS.—The packed cell process for sulphuric acid. E. L. Larison. *Chem. and Met. Eng.*, May 3, 1922, pp. 830–837.

Synthetic acetic acid. *Chem. Age* (N. York), April, 1922, pp. 155–156.

ELECTRO-CHEMISTRY.—Electric cast iron. *Chem. and Met. Eng.*, May 3, 1922, pp. 820–822.

Studies on the electro-deposition of lead from Mather's perchlorate bath. Part I. W. E. Hughes. *J. Phys. Chem.*, April, 1922, pp. 316–323.

French

ANTHRAQUINONE.—The chemistry of anthraquinone. Part I. E. Grandmougin. *Chim. et Ind.*, April, 1922, pp. 627–633.

PIGMENTS.—Manufacture and properties of titanium white. C. Coffignier. *Chim. et Ind.*, April, 1922, pp. 651–661.

ACIDS.—The manufacture of sulphuric acid by the contact process. Part III. H. Braidy. *L'Ind. Chim.*, April, 1922, pp. 138–142.

Formation of hydrocyanic acid by the oxidation of formaldehyde in an ammoniacal-silver medium. R. Fosse and A. Hieulle. *Compt. rend.*, April 10, 1922, pp. 1021–1023.

AMMONIA.—Catalysis and synthesis of ammonia. P. Firmin. *L'Ind. Chim.*, April, 1922, pp. 147–151.

ZINC.—Notes on zinc dust. A. Billaz. *L'Ind. Chim.*, April, 1922, pp. 152–157.

BICHROMATE.—The manufacture of sodium bichromate and its analytical control. G. Bessa. *L'Ind. Chim.*, April, 1922, pp. 143–147.

ELECTRO-CHEMISTRY.—Electro-osmosis. P. Bary. Bibliography. *Chim. et Ind.*, April, 1922, pp. 640–650.

REACTIONS.—The action of acids on ammonium molybdomalate. E. Darmois. *Compt. rend.*, April 18, 1922, pp. 1062–1064.

The rate of absorption of carbon dioxide by alkaline solutions. P. Riou. *Compt. rend.*, April 10, 1922, pp. 1017–1019.

AMMONIUM CHLORIDE.—The preparation of ammonium chloride. M. Monval. *Compt. rend.*, April 10, 1922, pp. 1014–1017.

ANALYSIS.—Methods for the analysis of waters. F. Touplain. *Chim. et Ind.*, April, 1922, pp. 634–639.

New method for the volumetric estimation of copper. S. Minovici and A. Jonescu. *Ann. Chim. Analyt.*, April 15, 1922, pp. 99–102.

Study of the estimation of manganese by the Knorre method. Part II. Nicolardot, Geloso and Réglade. *Ann. Chim. Analyt.*, April 15, 1922, pp. 102–110.

Rapid determination of the acetyl index of fats. A. Leys. *Ann. Chim. Analyt.*, April 15, 1922, pp. 110–115.

German

ACIDS.—The distillation of aqueous nitric acid and of nitric acid-sulphuric acid mixtures. E. Berl and O. Samtleben. *Z. angew. Chem. ;* Part I., April 28, 1922, pp. 201–202 ; Part II., May 2, 1922, pp. 206–211.

TECHNOLOGY.—The evaporation of liquids under vacuum. Part V. W. Mason. *Chem.-Zeit.*, April 20, 1922, pp. 354–356.

ZINC.—The separation of zinc by means of ammonium phosphate. G. Luff, *Chem.-Zeit.*, April 25, 1922, pp. 365–366.

OILS.—The preparation of benzine and lubricating oil from coals and crude oils. W. Frey and A. Faber. *Chem.-Zeit.*, April 27, 1922, pp. 377–379.

ZIRCONIUM.—Possible new uses for zirconium. R. E. Kirchner. *Chem.-Zeit.*, April 27, 1922, p. 380.

REACTIONS.—The action of nitrogen on mixtures of barium oxide and carbon at high temperatures. P. Askenasy and F. Grude. *Z. Elektrochem.*, March, 1922, pp. 130-151.

Compounds of iodine with the constituents of starch. H. v. Euler and K. Myrbäck. *Annalen*, April 25, 1922, pp. 1–24.

CYANAMIDE.—Syntheses with cyanamide ; cyanamido ethyl alcohol and guanido ethyl alcohol. E. Fromm. *Ber.*, April 8, 1922, pp. 902–911.

ALDEHYDES.—Vanillin isomers of the resorcyl series. E. Ott and E. Nauen. *Ber.*, April 8, 1922, pp. 920-929.

SUGARS.—Syntheses of mixed acylated halogen sugars. K. Freudenberg and O. Ivers. *Ber.*, April 8, 1922, pp. 929–941.

CATECHIN.—The optical activity of catechin. K. Feist and A. Futtermenger. *Ber.*, April 8, 1922, pp. 942–944.

COLOUR.—The halochromism and "solvatochromism" of dibenzalacetone and simple ketones, as well as their ketochlorides. A. Hantzsch. *Ber.*, April 8, 1922, pp. 953–979.

Halochromism of carbinols. S. Skraup and L. Freundlich. *Ber.*, April 8, 1922, pp. 1073–1080.

AMINO-ACIDS.—Both modifications of glycocoll ; together with a contribution to the technique of methylation with diazo-methane. H. Biltz and H. Paetzold. *Ber.*, April 8, 1922, pp. 1066–1073.

ORGANIC SULPHUR COMPOUNDS.—Derivatives of dithio-ethylene and dithio-acetylene and the additive capacity of multiple bonds. E. Fromm and E. Siebert. *Ber.*, April 8, 1922, pp. 1014–1030.

ANALYSIS.—Micro molecular weight determination in the melting point apparatus. K. Rast. *Ber.*, April 8, 1922, pp. 1051–1054.

Patent Literature

Abstracts of Complete Specifications

178,138. Extraction of Tannin from Tanstuffs, Method and Apparatus for. W. A. Fraymouth, 63, St. James's Street, London, S.W.1; J. A. Reavell, 28, Oakwood Avenue, Beckenham, Kent; and Kestner Evaporator and Engineering Co., Ltd., 5, Grosvenor Gardens, London, S.W.1. Application date, October 5, 1920.

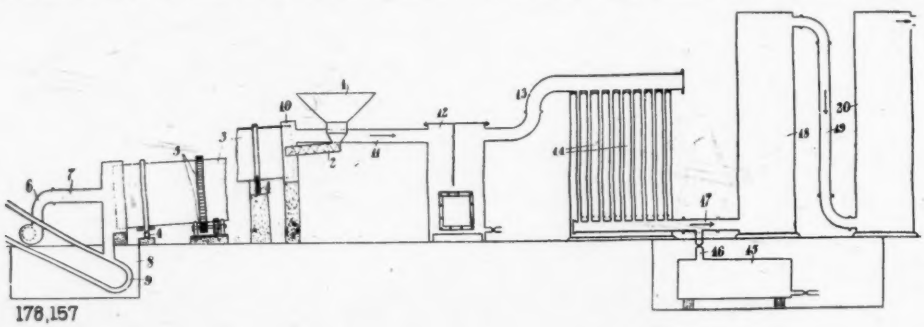
The powdered tanstuff is first wetted in the central zone of a gas-lift-agitator, part of the liquor is passed to another zone, another part to a quiescent zone, and another part to one of a series of gas-lift-agitators, through which the liquor is passed in series to produce a concentrated solution. The apparatus used is the same as that described in connexion with Specification 177,820 (see The Chemical Age of last week, Vol. VI., p. 634).

178,139. Crushed or Milled Tanstuffs, Method of and Apparatus for the Treatment of Fine Powdered Particles of. W. A. Fraymouth, 63, St. James's Street, London, S.W.1; J. A. Reavell, 28, Oakwood Avenue, Beckenham, Kent; and Kestner Evaporator and Engineering Co., Ltd. Application date, October 5, 1920.

In the known process for the extraction of tannin from crushed or milled bark, difficulties are experienced in the leaching process due to the presence of fine dust. In this invention the dust is separated from the fibrous material by passing it through a sieve, and is then treated as described in Specification No. 178,138 above. The fibrous material is treated in the usual leach pits. The fine powder may alternatively be treated in a modified leach pit which is provided with a cylindrical screen and one or more "uplift" tubes, as described in Specification No. 177,820, mentioned above. The fibrous material is treated to produce a tannin liquor having 10 per cent. of solid matter, and this liquor is used for treating the powdered material to obtain a strong solution.

178,157. Distillation of Solid Hydrocarbon-containing Materials. N. V. S. Knibbs, 810–811, Salisbury House, London, E.C.2. Application date, December 7th, 1920.

The apparatus is for distilling solid material containing hydro carbons such as shales, coal, lignite, etc., and is particularly suitable for substances such as oil shale, which contain a considerable proportion of inorganic material. The material is crushed to a ¾ in. screen, and delivered from a hopper 1 to a conveyor 2, from which it passes to the upper end of a slightly inclined retort 3, which is rotated by gearing 5, similar to rotary kilns used for burning Portland cement. The material is distilled by the injection of air, with or without fuel sufficient to produce the necessary heat. The air is introduced through the pipe 7, and the inorganic residue passes to a chamber 8 having a conveyor 9. The hot gases pass through a pipe 11 to a dust separator 12, and thence through a pipe 13 to a condenser 14, where the volatile products are extracted. These products pass through a pipe 16 to a tank 15, and the gases pass through a pipe 17 to two scrubbing towers 18, 20, arranged in series. These scrubbers absorb the ammonia, or they may be fed with oil to absorb low-boiling distillation products. In operating the retort 3 the draught is so regulated that the material is preheated, and the volatile material distilled off in the upper half of the retort; in the next zone, which may be one-quarter of the length of the retort, the less volatile and non-volatile carbon-containing residues are burnt; and in the final zone the inorganic residue is cooled, and the incoming air preheated. If necessary, the temperature in the retort may be reduced by admitting steam or inert gas, and the yield of ammonia may thereby be increased. The volume of air is regulated so that the material entering the retort is distilled in a non-oxidising atmosphere. The temperature may also be controlled by varying the rate of feed of the material. The distillation is usually effected at atmospheric pressure, but the pressure and temperature may be varied to effect the cracking of some constituents to obtain lighter fractions. The uncondensible gases may be used for lighting, heating, or power purposes; the olefines, diolefines, etc., may be used for various chemical syntheses.



178,157

178,152. Viscose Solutions, Manufacture of. W. P. Dreaper, 27, Willow Road, Hampstead Heath, London, N.W.3. Application date, November 8, 1920.

In the usual process for producing viscose, the cellulose material is treated with a solution of caustic soda and then with carbon disulpbide to form a cellulose xanthate. In this process the action of the caustic soda on the cellulose material is usually irregular, leading to inequalities in the solution finally obtained. Such solutions are not satisfactory for the production of transparent films or artificial silk. These difficulties are avoided by treating the cellulose material with caustic soda solution at a temperature below 5° C., and preferably between—2° C. and 0° C. The cellulose material is placed in a closed vessel from which the air is exhausted, and the caustic soda is used in such quantities as to cover it completely. It is found that this produces less swelling of the fibrous material and a final solution of cellulose xanthate which is of lower viscosity than that obtained by the usual process. It is found that it is not necessary to maintain the caustic soda solution at the low temperature after it has once come into contact with the cellulose. The air in the containing vessel may be replaced by a gas which reacts with or is soluble in the caustic soda solution, so that the amount of residual gas after exhausting the vessel is reduced and oxidation of the cellulose is prevented. Suitable gases are ammonia or sulphur dioxide.

178,183. Refining and Otherwise Treating Oils, Fats and Tars. H. Plauson, 14, Huxter, Hamburg, Germany; and J. A. Vielle, 17, Waterloo Place, London, S.W.1. Application date, January 7, 1921.

Oils and the like may be refined by this process without using decolorising charcoal or large quantities of acids. The oil or the like is subjected to an intensive mechanical agitation or disintegration with a non-solvent, preferably water, in the colloid mill described in Specification No. 155,836 (see The Chemical Age, Vol. IV., p. 313.) The emulsion thus obtained is then subjected to "ultra filtration" at a high pressure through an extremely fine filtering material. A filter press of this kind is described in Specification No. 155,834 (see The Chemical Age, Vol. IV., p. 313). The pores of the filtering material employed should be from 0·0001 to 0·0005 mm.; such a material will filter out colouring matter, fatty acids, and salts of alkaline earths, while the oils pass through the material. In an example, a glyceride such as

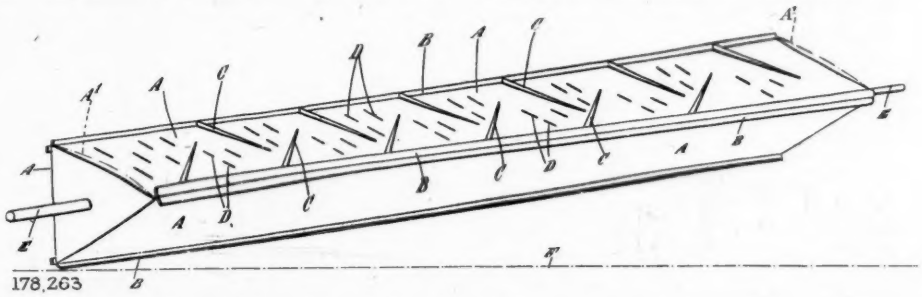
cottonseed oil is treated mechanically in the mill with an excess of water, and a small quantity of a heavy metal or earth basic compound such as barium hydrate is added to form a heavy metal or earth soap. The emulsion is then filtered as above. Water is finally removed by adding a suitable coagulent such as 1 to 5 per cent. of a neutral salt or 0·1 to 1 per cent. of an acid, or by heating to 50°–100° C. If mineral oil is treated in this manner, resins, paraffin wax, colouring matters and barium salts of the free acid are removed by the "ultra filtration." Unsaturated hydrocarbons are then removed by treating with liquid sulphur dioxide, or by the process described in Specification No. 156,123 (see THE CHEMICAL AGE, Vol. IV., p. 314). When wood tar is subjected to this treatment, the water-soluble constituents are dissolved and distributed colloidally through the liquid, and then may be removed by "ultra filtration," leaving a pitch which has a higher melting point and elasticity than is otherwise obtainable.

178,196. CELLULOSE, PROCESS FOR OBTAINING. H. P. Waentig and J. O. W. Gierisch, Wienerstrasse 6, Dresden, Saxony. Application date, January 10, 1921.

In the usual process for obtaining cellulose from raw materials such as wood by treating it with chlorine gas and then with caustic soda lye, it is found that the chlorine does not always penetrate the raw material, *e.g.*, wood chips, in a single operation. In this process the chlorine is employed under the pressure of liquid chlorine at ordinary temperature, *i.e.*, 6 to 7 atmospheres. The raw material is preferably boiled in a solution of caustic soda of 0·1 to 1 per cent. strength, or in milk of lime, which ensures a thorough penetration of the chlorine. If a finely-divided material such as straw is used, the chlorine is liable to cause local overheating. This may be avoided by diluting the chlorine with an indifferent gas such as air or carbon dioxide, either by mixing the gases beforehand or by using the chlorine and indifferent gas alternately. In treating straw, dilute hydrochloric acid may be used instead of the alkali. The material is finally treated with caustic soda lye of 1 per cent. strength at ordinary temperature. The "chlorine cellulose" obtained yields solutions of very high viscosity.

178,263. RECOVERY OF SALTS FROM THEIR SOLUTIONS. T. G. Tulloch, Bank Buildings, King Street, St. James', London. Application date, February 22, 1921.

The apparatus is for recovering salts from a mixture of their solutions by fractional crystallization. The table A is slightly inclined to the horizontal, and is provided with a rib B at each edge so as to form a shallow trough over which the solution flows. Baffles C project from each rib partly across the trough in an inclined direction from each side alternately. Smaller baffles D are arranged between the main baffles to assist in spreading the liquid. The solution evaporates while



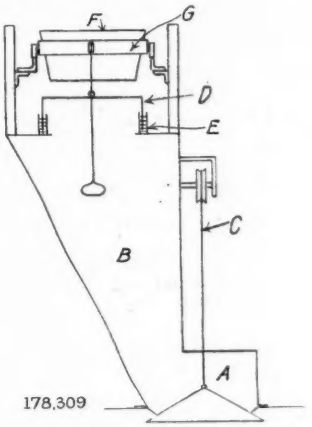
flowing over the table, and the less soluble salts are deposited towards the upper end while the more soluble salts are deposited towards the lower end of the table. The crystals are collected mainly in the shallow pockets formed between the ribs B and the inclined and tapering baffles C. Three such tables may be arranged in a triangular frame mounted on trunnions E, so that the deposited salts may be removed from one table while another table is brought into use. A series of such tables may be arranged one above the other, so that the liquid passes over them in succession. The table may be heated by an electrical resistance embedded in it, and it may be enclosed by a cover in which vapour may be collected.

178,283. ROTARY FURNACES. F. L. Duffield, Harboro Rocks Farm, Brasington, Derby, and C. A. Longbottom, Forest Hill, Worksop, Notts. Application date, March 9, 1921.

A refractory tube for a rotary furnace is constructed by ramming granular refractory material between an inner and outer metal tube. When in use, the inner metal tube gradually becomes fused and absorbed by the refractory material, forming a solid lining. A suitable refractory material is composed of shrunk granular dolomite and hydrated tar. Such tubes may have an external diameter of 3 feet, and a lining of 6 inches in thickness.

178,309. CHARGING DEVICE FOR RETORTS, PRODUCERS, OR THE LIKE. G. D. Hardie, The Firs, Clarkston, Renfrew, and Maclaurin Carbonisation, Ltd., Grangemouth, Stirling. Application date, April 8, 1921.

The charging apparatus is constructed with the object of maintaining a producer or retort completely gas-tight without depending on the tightness of the usual operating bell. A



small chamber A is arranged immediately over the bell and communicates with a large chamber B above and to one side of it. This chamber is provided with an inclined side to direct the material into the chamber A. The bell is suspended by a wire rope C passing over a pulley, and counter-weighted. The larger chamber is provided with a cover D dipping into a water seal E. The cover D, together with the charging funnel F, are carried on a small carriage G so that the cover D may be raised and removed from the opening and the funnel brought over the opening in a single operation.

178,337. RUBBER LATEX, PREPARATION OF PRESERVATIVE SUBSTANCES FOR. F. G. McGuire, Glenbank, Bangor, County Down; A. A. Agar, Ardmore, Holywood, County Down, Ireland; and H. T. Coulter, Inverary, Strandtown, Belfast, legal representatives of the late Sir S. C. Davidson, Sirocco Engineering Works, Belfast. Application date, April 29, 1921.

The use of alkalised phenol as a preservative for freshly tapped rubber latex is already known, but it has the disadvantage that it is a liquid which requires fluid-tight metal drums for transport. In the present invention a solid form of alkalised phenol is used. A mixture of 2 parts of phenol

crystals and 1 part of solid caustic soda is ground together in a warm receptacle with the formation of sodium phenate as a fine white powder. The powder is pressed into blocks which are preferably covered with metal foil for transport. The preservative solution is produced by dissolving the blocks in water to produce a solution of 3–5 per cent. strength.

178,373. Alcohol Fuel. J. Penhale, Post Office, Box 668, Johannesburg, South Africa. Application date, July 19, 1921.

Alcohol for use as a fuel for internal combustion engines has its explosive power increased by adding up to 1 per cent. of ethyl or methyl nitrate.

Note.—Abstracts of the following specifications, which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—152,029 (Metals Extraction Corporation of America), relating to separation of metal from ores, see Vol. III., p. 714 ; 156,713 (C. Giesecke), relating to making agglomerates to be sintered in shaft furnaces, see Vol. IV., p. 377 ; 157,745 (P. Brat), relating to removing nitrogen and ammonia from peat, see Vol. IV., p. 455 ; 158,887 (G. Haglung), relating to copper-nickel matte, see Vol. IV., p. 541 ; 162,269 (Kansas City Gasoline Co.), relating to cracking hydrocarbons, see Vol. IV., p. 736 ; 165,767 (New Jersey Zinc Co.), relating to zinc oxide, see Vol. V., p. 287.

International Specifications not yet Accepted

176,811. Metallic and Non-metallic Chlorides. Consortium für Elektrochemische Industrie-Ges., 20, Zielstattstrasse, Munich, Germany. International Convention date, March 11, 1921.

A mixture of chlorine and sulphur chloride is passed over a heated mixture of a metallic or non-metallic oxide and carbon to obtain the corresponding chloride. The process is particularly applicable for obtaining silicon or aluminium chlorides. The gaseous mixture may be obtained by passing chlorine through an evaporator containing sulphur chloride, or the sulphur chloride may be produced in the mixture by adding pyrites or a sulphate to the mixture of oxide and carbon. In producing aluminium chloride, a sublimate containing aluminium chloride and sulphur chloride is obtained, and this mixture is distilled under reduced pressure to separate the chlorides.

177,174. Alkali Chromates and Bichromates. A. J. B. Jouve, 1, Boulevard St. Germain, Paris ; A. Helbronner, 78, Boulevard Malesherbes, Paris ; and Soc. Hydro-Electrique et Métallurgique du Palais, 11^{bi}, Rue Roquepine, Paris. International Convention date, March 17, 1921.

An alkali carbonate solution is electrolysed without a diaphragm, and with anodes of ferrochrome containing not less than 40–45 per cent. of chromium. The cathodes may be of lead, and a current density of some hundreds of ampères per square metre may be used to heat the solution. An alkali chromate is thereby produced, and if a concentrated solution is electrolysed, the product is near the crystallising point. If the electrolysis is continued, the bichromate is produced. If excess of alkali carbonate is then added to the bichromate, the neutral chromate is obtained. The precipitate of iron oxide produced may be periodically removed by filtering or centrifuging.

Latest Notifications.

179,523. Manufacture of aldol from acetaldehyde. Elektrizitätswerk Lonza. May 4, 1921.

179,493. Method of and means for effecting heat interchange between two fluids, particularly applicable for use in distilling oils. Robertson, T. E. (Power Specialty Co.) November 26, 1921.

179,544. Process for the manufacture of salts of urea and more especially of nitrate of urea, starting from cyanamides. Soc. d'Etudes Chimiques pour l'Industrie. May 3, 1921.

Specifications Accepted, with Date of Application

154,213. Obtaining reactions between a gas and another substance, Process and apparatus for. E. Slatineanu. November 22, 1919.

158,891. Pure retort carbon, Manufacture of. I. Szarvasy. February 28, 1914.

159,143. Ore and like materials, Process of treating. Trent Process Corporation. February 21, 1920.

159,193. Recovery of nitrogen in the form of ammonia from peat or the like. P. Brat. February 18, 1920.

161,539. α-dialkyl-aminœthyl β-aracyl oxybutyric acid esters, Manufacture of. Farbwerke vorm. Meister, Lucius and Brüning. April 10, 1920.

161,560. Collecting and purifying minerals, Process of. Trent Process Corporation. April 9, 1920.

169,145. Anthraquinone, Manufacture of. Chemische Fabriken Worms Akt.-Ges. September 13, 1920.

171,074. Catalytic process for obtaining reactions between a gas and another substance and apparatus for carrying out the process. E. Slatineanu. November 5, 1920. Addition to 154,213.

178,869. Gas producers or generators. J. W. Parker and H. W. Bamber. October 20, 1920.

178,889. Coking the discharged material from low temperature distillation apparatus. E. Barrs. December 23, 1920.

178,952. Combustion of fuel in furnaces with recovery of the by-products, Process and apparatus for. T. O. Wilton. January 28, 1921.

178,994. Carbonisation of coal, shale, peat or other materials. G. T. Beilby. February 16, 1921.

179,012. Diastase or a solution of diastase, Process of preparing. K. Kashiwagi. February 24, 1921.

179,031. *o*-alkyl derivatives of hydrocupreine, Process for the manufacture of. Vereinigte Chinenfabriken Zimmer and Co. Ges., and H. Thron. March 16, 1921.

179,060. Measuring the calorific value of combustible gases or other chemically reactive agents, Method of and apparatus for. Igranic Electric Co., Ltd. (*Cutler-Hammer Manufacturing Co.*). April 7, 1921.

179,096. Hydrocyanic acid, Method of producing. H. G. C. Fairweather. (*Air Reduction Co., Inc.*). July 6, 1921.

179,108. Active wood charcoal, Manufacture of. W. Carpmael. (*Chemische Fabrik auf Actien, vorm. E. Schering.*) August 24, 1921.

179,124. Colloidal dispersions, Apparatus for producing. W. P. Thompson. (*H. O. Traun's Forschungslaboratorium Ges.*). December 24, 1920.

Applications for Patents

Cateret G., and Devaux, M. Process of producing oxygen compounds of titanium. 13466. May 12.

—— Process of preparing pigments from titanium compounds contaminated with sulphuric acid. 13467. May 12.

Cellulose et Papiers Soc. de Récherchés et d'Applications. Extraction of oils or fats from oleaginous vegetable matter. 12952. May 8. (France, May 12, 1921.)

Centro Tecnico de Fumigacion, and Smith, A. J. Q. Production of hydrocyanic acid. 13194. May 10.

Courtaulds, Ltd. Effecting separation of sodium carbonate from liquors or solutions containing caustic soda. 13444. May 12.

Cross, C. F., and Engelstad, A. Treatment of wood, &c., for obtaining lignone. 12943. May 8.

—— Manufacture of viscose. 12944. May 8.

Galbraith, W. L., and Taylay, J. G. Purification of gases from hydrogen cyanide. 13083. May 9.

Hechenbleikner, I., and Oliver, T. C. Treatment of acids. 13567. May 13.

Heinemann, A. Process of manufacturing formic aldehyde. 13340. May 11. (Germany, May 11, 1921.)

Illingworth, S. R. Plant for carbonization of coal. 13359. May 11.

Pellegrini, G., and Poma, G. Chemical reduction process by means of sodium amalgam. 13222. May 10.

Scottish Dyes, Ltd., Thomas, F., Thomson, R. F., and Davies, A. H. Production of colouring-matters. 13335. May 11.

Soc. of Chemical Industry in Basle, and Imray, O. Y. Manufacture of condensation products of the anthraquinone series. 13571. May 13.

Young, G. Process for obtaining oils of low sulphur content from shales and non-caking coals. 13034. May 9.

Zack, M. Obtaining argon from atmospheric air. 13290. May 11. (Germany, May 11, 1921.)

Patents Court Cases

Application has been made under Section 24 of the Patents and Designs Acts, 1907 and 1919, for the following patent to be indorsed "Licences of Right: "—11,542/1913, (W. Fuchs) relating to the manufacture of catalysing agents.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

LONDON, MAY 18, 1922.

TAKING a broad view, there can be no doubt that trade is improving and that the weight of goods moving is steadily increasing. There has been somewhat of a set-back in the Industrial North, but it is thought to be only temporary and may be to some extent due to the industrial troubles.

Movements in price are principally upward, and from the Continent, in particular, strong advances in the price of many chemicals are advised.

General Chemicals

ACETONE is in active demand and the price is unchanged.

ACID ACETIC is much firmer in price, and export quotations in particular have advanced strongly. Supplies are scarce and a further improvement is anticipated.

ACID FORMIC is a steady market, although the turnover remains on the small side.

ACID LACTIC is unchanged.

ACID OXALIC.—Business has been a little better and the limited stock remains in strong hands.

BARIUM CHLORIDE is almost unobtainable for early delivery. Foreign makers are not competing with local supplies.

CREAM OF TARTAR remains in good demand, but the forward tendency is weaker.

COPPER SULPHATE has not been quite so active, but, on the other hand, prices seem more likely to go up than down.

FORMALDEHYDE is very quiet indeed. The price seems to have found its level.

IRON SULPHATE is unchanged.

LEAD ACETATE is in better demand than has been the case for some time past. Higher prices are not unlikely.

LEAD NITRATE.—There has been a small inquiry but very little actual business is passing.

LITHOPONE is in good request and shows a firmer tendency.

POTASSIUM CARBONATE is almost a nominal market with visible surplus stocks.

POTASSIUM CAUSTIC is very quiet and the price remains unsteady.

POTASSIUM PERMANGANATE.—There is a steady trade of retail proportions; price is firm.

POTASSIUM PRUSSIATE is firm with little obtainable.

SODIUM ACETATE is in active demand. There has been a substantial advance in price and supplies are scarce.

SODIUM BICHROMATE is weaker owing to foreign offerings.

SODIUM BISULPHITE remains unchanged.

SODIUM NITRITE.—A better trade is reported at recent levels.

SODIUM PHOSPHATE.—An improvement in the market appears to be within sight, but at the moment the price remains easy.

SODIUM PRUSSIATE is in particularly strong demand and holders' ideas of value have changed substantially during the past week. Makers are sold out.

WHITE LEAD remains a firm market with a fair business passing.

ZINC OXIDE is inquired for and supplies from the leading makers are difficult to obtain for early delivery.

Coal Tar Intermediates

SOME tendency to improvement continues in evidence and interest both on home and export account has been greater.

ALPHA NAPHTHOL is in demand for home trade and the price is firm with no great quantity of spot material available.

ALPHA NAPHTHYLAMINE is somewhat firmer with a decent inquiry.

ANILINE OIL AND SALT continue to pass regularly into consumption at makers' figures.

BENZIDINE BASE is featureless.

BETA NAPHTHOL is slightly easier in price, but the demand continues quite good.

DIMETHYLANILINE is firm with a decent business passing for prompt delivery.

DINITROCHLORBENZOL is quiet, but the price is very firm.

DINITROPHENOL has been inquired for on export account.

DIPHENYLAMINE continues firm, with no large quantities available.

"H" ACID is steady, with a fair business passing.

META TOLUENEDIAMINE has been interesting on home account.

NITRO NAPHTHALENE is a shade easier and fair orders have been received.

NAPHTHIONIC ACID.—Business has passed on home account.

NITRO BENZOL is without change.

PARA AMIDO PHENOL has been inquired for.

PARADICHLORBENZOL.—Export buyers are interested and fair business has been placed.

"R" ACID has been bought for home consumption.

RESORCIN is without special feature.

Coal Tar Products

THERE is little change in the market for coal tar products since last week.

90's BENZOL is still very weak, and many makers are carrying large stocks. It is not worth more than 2s. on rails.

PURE BENZOL is in poor demand, and is worth about 2s. 4d. on rails.

CREOSOTE OIL remains steady at 4¼d. per gallon in the North, and 4⅜d. per gallon in the South.

CRESYLIC ACID is also steady, although there is no great inquiry. The Pale quality, 97/99 per cent., is worth about 2s. per gallon on rails, while the Dark quality, 95/97 per cent., is worth about 1s. 9d. on rails.

SOLVENT NAPHTHA is very weak, and is not worth more than 1s. 9d. on rails.

HEAVY NAPHTHA is also uninteresting, and is quoted at 1s. 10d. on rails at works.

NAPHTHALENE is in poor demand, the crude qualities being worth from £5 to £7 per ton, while the refined quality is worth £15 to £16 per ton.

PITCH.—The market is still very irregular. A high price is being paid for quantities for immediate shipment, but there are few buyers available. The price on the East Coast is still 60s. to 62s. 6d., while London is being done at 67s. 6d. f.o.b.

Sulphate of Ammonia

There is no change in the home trade prices, but the demand for export is quieter, and prices are lower owing to foreign competition.

Current Prices

Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	1	8	to	0	1	10
Acetone oil	ton	77	10	0	to	80	0	0
Acetone, pure	ton	72	0	0	to	73	0	0
Acid, Acetic, glacial, 99–100%	ton	59	0	0	to	60	0	0
Acetic, 80% pure	ton	43	0	0	to	44	0	0
Arsenic, liquid, 2000 s.g.	ton	67	0	0	to	70	0	0
Boric, cryst.	ton	60	0	0	to	65	0	0
Carbolic, cryst. 39–40%	lb.	0	0	6	to	0	0	6¼
Citric	lb.	0	2	2	to	0	2	3
Formic, 80%	ton	68	0	0	to	70	0	0
Gallic, pure	lb.	0	3	3	to	0	3	6
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	40	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	45	0	0
Nitric, 80 Tw.	ton	30	0	0	to	31	0	0
Oxalic	lb.	0	0	8¼	to	0	0	8½
Phosphoric, 1.5	ton	38	0	0	to	40	0	0
Pyrogallic, cryst.	lb.	0	6	3	to	0	6	6
Salicylic, Technical	lb.	0	0	10½	to	0	1	0
Salicylic, B.P.	lb.	0	1	3	to	0	1	5
Sulphuric, 92–93%	ton	7	10	0	to	8	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	3½	to	0	1	4
Alum, lump	ton	14	0	0	to	15	0	0
Alum, chrome	ton	30	10	0	to	32	0	0
Alumino ferric	ton	8	10	0	to	9	0	0

	Per	£	s.	d.		£	s.	d.
Aluminium, sulphate, 14–15% ..	ton	12	0	0	to	13	0	0
Aluminium, sulphate, 17–18% ..	ton	13	10	0	to	14	10	0
Ammonia, anhydrous	lb.	0	1	8	to	0	1	10
Ammonia, .880	ton	33	0	0	to	35	0	0
Ammonia, .920	ton	21	0	0	to	23	0	0
Ammonia, carbonate	lb.	0	0	5	to		—	
Ammonia, chloride	ton	60	0	0	to	65	0	0
Ammonia, muriate (galvanisers)	ton	35	0	0	to	37	10	0
Ammonia, nitrate (pure)	ton	35	0	0	to	40	0	0
Ammonia, phosphate	ton	80	0	0	to	85	0	0
Ammonia, sulphocyanide ..	lb.	0	1	10	to	0	2	0
Amyl acetate	ton	175	0	0	to	185	0	0
Arsenic, white, powdered ..	ton	42	0	0	to	44	0	0
Barium, carbonate, 92–94% ..	ton	12	10	0	to	13	0	0
Barium, Chlorate	ton	60	0	0	to	68	0	0
Barium Chloride	ton	17	0	0	to	18	0	0
Nitrate	ton	35	0	0	to	37	0	0
Sulphate, blanc fixe, dry ..	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp ..	ton	10	5	0	to	10	10	0
Sulphocyanide, 95% ..	lb.	0	1	0	to	0	1	3
Bleaching powder, 35–37% ..	ton	13	0	0	to	13	10	0
Borax crystals	ton	29	0	0	to	33	0	0
Calcium acetate, Brown	ton	9	0	0	to	9	10	0
,, ,, Grey	ton	13	0	0	to	13	19	0
Calcium Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	6	10	0	to	7	0	0
Carbon bisulphide	ton	50	0	0	to	52	0	0
Casein, technical	ton	50	0	0	to	65	0	0
Cerium oxalate	lb.	0	3	6	to	0	3	9
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	2	to	0	1	3
Sulphate	ton	28	10	0	to	29	0	0
Cream Tartar, 98–100% ..	ton	110	0	0	to	112	10	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol. ..	ton	72	10	0	to	73	0	0
Formusol (Rongalite)	lb.	0	2	6	to	0	2	9
Glauber salts, commercial ..	ton	5	10	0	to	6	0	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols. ..	gal.	0	2	5	to	0	2	6
Iron perchloride	ton	30	0	0	to	32	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	42	0	0	to	43	0	0
Carbonate (White Lead) ..	ton	42	0	0	to	46	0	0
Nitrate	ton	46	10	0	to	48	10	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	24	0	0	to	25	0	0
Magnesium chloride	ton	10	0	0	to	10	10	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	8	0	0	to	8	10	0
Sulphate (Druggists') ..	ton	13	10	0	to	14	10	0
Manganese, Borate	ton	65	0	0	to	70	0	0
Sulphate	ton	60	0	0	to	62	0	0
Methyl acetone	ton	60	0	0	to	65	0	0
Alcohol, 1% acetone ..	ton	65	10	0	to	66	0	0
Nickel sulphate, single salt ..	ton	49	0	0	to	51	0	0
Ammonium sulphate, double salt	ton	51	0	0	to	52	0	0
Potash, Caustic	ton	33	0	0	to	34	0	0
Potassium bichromate	lb.	0	0	6¾	to		—	
Carbonate, 90%	ton	31	0	0	to	33	0	0
Chloride, 80%	ton	12	0	0	to	12	10	0
Chlorate	lb.	0	0	4½	to	0	0	5
Meta bisulphite, 50–52% ..	ton	84	0	0	to	90	0	0
Nitrate, refined	ton	45	0	0	to	47	0	0
Permanganate	lb.	0	0	9	to	0	0	10
Prussiate, red	lb.	0	4	6	to	0	4	9
Prussiate, yellow	lb.	0	1	2½	to	0	1	3
Sulphate, 90%	ton	15	0	0	to	15	10	0
Salammoniac, firsts	cwt.	3	5	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	23	0	0	to	24	0	0
Arseniate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	5¼	to		—	
Bisulphite, 60–62% ..	ton	23	0	0	to	24	0	0
Chlorate	lb.	0	0	3¾	to	0	0	4
Caustic, 70%	ton	22	10	0	to	23	0	0
Caustic, 76%	ton	25	0	0	to	25	10	0
Hydrosulphite, powder, 85%	lb.	0	1	9	to	0	2	0
Hyposulphite, commercial	ton	13	10	0	to	14	0	0
Nitrite, 96–98%	ton	31	0	0	to	32	0	0
Phosphate, crystal	ton	18	10	0	to	19	0	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	9½	to	0	0	10
Sulphide, crystals	ton	13	0	0	to	14	0	0
Sulphide, solid, 60–62% ..	ton	21	10	0	to	23	10	0
Sulphite, cryst.	ton	12	10	0	to	13	0	0
Strontium carbonate	ton	55	0	0	to	60	0	0
Strontium Nitrate	ton	58	0	0	to	60	10	0
Strontium Sulphate, white ..	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Sulphur, Flowers	ton	13	0	0	to	14	0	0
Roll	ton	13	0	0	to	14	0	0
Tartar emetic	lb.	0	1	6	to	0	1	7
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	5	to	0	1	6
Zinc chloride 102° Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96–98% ..	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	36	0	0	to	38	0	0
Dust, 90%	ton	45	0	0	to	47	10	0
Sulphate	ton	18	10	0	to	19	10	0

Coal Tar Intermediates, &c.

	Per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	2	3	to	0	2	6
Alphanaphthol, refined	lb.	0	3	0	to	0	3	3
Alphanaphthylamine	lb.	0	2	0	to	0	2	1
Aniline oil, drums extra	lb.	0	1	0	to	0	1	1
Aniline salts	lb.	0	1	1	to	0	1	2
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine) ..	lb.	0	3	9	to	0	4	3
Benzidine, base	lb.	0	5	9	to	0	6	0
Benzidine, sulphate	lb.	0	5	9	to	0	6	0
Benzoic acid	lb.	0	1	7½	to	0	1	9
Benzoate of soda	lb.	0	1	6	to	0	1	7
Benzyl chloride, technical ..	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	4	9	to	0	5	0
Betanaphthol	lb.	0	1	6	to	0	1	9
Betanaphthylamine, technical ..	lb.	0	6	0	to	0	7	0
Croceine Acid, 100% basis ..	lb.	0	3	6	to	0	3	9
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	2	9	to	0	3	0
Dinitrobenzol	lb.	0	1	3	to	0	1	4
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	5	to	0	1	6
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	2	6	to	0	2	9
Diphenylamine	lb.	0	4	3	to	0	4	6
H-Acid	lb.	0	6	6	to	0	7	0
Metaphenylenediamine	lb.	0	5	6	to	0	5	9
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	0	to	0	6	6½
Monosulphonic Acid (2.7) ..	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude ..	lb.	0	3	0	to	0	3	3
Naphthionate of Soda	lb.	0	3	0	to	0	3	3
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Neville Winther Acid	lb.	0	7	9	to	0	8	0
Nitronaphthalene	lb.	0	1	4	to	0	1	5
Nitrotoluol	lb.	0	1	0	to	0	1	2
Orthoamidophenol, base	lb.	0	10	0	to	0	10	5
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	1	6	to	0	1	9
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	10	0	to	0	10	6
Para-amidophenol, hydrochlor ..	lb.	0	10	6	to	0	11	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	3	6	to	0	3	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	5	0	to	0	5	3
Paraphenylenediamine, distilled	lb.	0	10	6	to	0	10	9

Alsatian Potash

THE Alsace-Lorraine Trading Co. report :—" There is a good deal of inquiry for supplies of kainit with a minimum of 14 per cent. potash, for delivery in the autumn. A few cargoes which came late for the spring season will probably be put into stock now by the larger dealers in anticipation of active buying towards the end of the year. Current quotations remain approximately as follows :—

French kainit, 14 per cent., f.o.r., in bags, £2 7s. 6d.–£2 12s. 6d.

Sylvinite, 20 per cent., f.o.r., in bags, £3 12s. 6d.

Sylvinite, 30 per cent., f.o.r., in bags, £5 12s. 6d.

Muriate of Potash, 50 per cent., f.o.r., in bags, £10 10s.

Sulphate of potash, 90 per cent. purity, f.o.r., in bags, £14 10s.

The discussions which have now been concluded in reference to the proposed increase in the price of potash in Germany, will probably lead to some definite alteration in the export prices.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

GLASGOW, MAY 17, 1922.

THERE has been a marked improvement in business during the past week, and inquiries, particularly for export, have been numerous.

Prices, on the whole, have been well maintained.

Industrial Chemicals

ACID, ACETIC.—Glacial quoted at £58 to £59 ex quay; 80% B.P. quality, £43 to £44 per ton ex quay; 80% Technical offered at £37 per ton c.i.f. Stocks are apparently low, spot lots being difficult to obtain at reasonable prices.

ACID, BORACIC.—Crystal or granulated, £60 per ton; powdered, £62 per ton; minimum ton lots. Usual local demand.

ACID, CARBOLIC.—Fair inquiry. Price 5¾d. per lb.

ACID, FORMIC.—80/85% quoted at £62 10s. ex works, casks free.

ACID, HYDROCHLORIC.—Price unchanged at 6s. 6d. per carboy ex works.

ACID, OXALIC.—Offered at 8d. per lb., carriage paid.

ACID, SULPHURIC.—144° Tw., £4 per ton; 168°, £7 5s. per ton ex works; dearsenicated £1 per ton more.

ACID, TARTARIC.—B.P. Crystals, spot delivery, about 1s. 4d. per lb. Offered at 1s. 2¾d., less 5% c.i.f.

ALUMINA SULPHATE.—Fair export inquiry; 17/18%, £15 per ton.

ALUM, LUMP POTASH.—English make, £16 per ton ex station; Continental make, about £15 per ton ex store.

AMMONIA, ANHYDROUS.—Little inquiry; quoted 1s. 6d. to 1s. 7d. per lb. ex works.

AMMONIA, CARBONATE.—In fair demand. Price 4d. to 4½d. per lb.

AMMONIA, SALAMMONIAC CRYSTALS.—Quoted £57 to £58 per ton. Little inquiry.

AMMONIA, LIQUID, 880°.—Few inquiries for small lots. Quoted 3½d. to 4d. per lb.

AMMONIA, SULPHATE.—25¼%, £15 10s. per ton; 25¾%, neutral, £16 13s. per ton, May delivery. Stocks low, and supplies for prompt delivery scarce.

ARSENIC, WHITE POWDERED.—Makers quoting dearer, about £40 ex works.

BARIUM CHLORIDE.—Fair inquiry for export. Quoted £17 to £18 per ton f.o.b.; Continental quotations of £16 per ton c.i.f.

BARYTES.—English makers advise reduction in price. Finest white now £5 15s. per ton f.o.r. works; grey, £3 15s. per ton f.o.r. works.

BLEACHING POWDER.—Price £14 per ton ex station. Still in little request.

BORAX.—Crystals, £29 per ton; powdered, £30 per ton ex station; minimum ton lots.

CALCIUM CHLORIDE.—English makers' price, £6 10s. per ton ex quay; Continental offers, about £6 to £6 5s. c.i.f. U.K.

COPPER SULPHATE.—One or two inquiries for export. Quoted £25 to £26 per ton f.o.b.

FORMALDEHYDE, 40%.—Offered at £67 per ton delivered.

GLAUBER SALTS.—Fair inquiry at £5 to £6 per ton.

LEAD, ACETATE.—Brown, £34 to £35 per ton; white crystals, £39 to £40 per ton. Continental make now offering at about the same price.

LEAD.—Red, £36 10s.; white, £51. Moderate demand for red.

MAGNESITE, CALCINED.—Practically no demand. Spot lots at £11 to £12 per ton ex store.

MAGNESIUM, CHLORIDE.—Fair inquiry. Spot lots at £7 10s. to £8 ex store. Continental offers of £6 5s. c.i.f. U.K.

MAGNESIUM SULPHATE (EPSOM SALTS).—Usual local demand. Commercial quality, £7 10s.; B.P. quality, £9 15s. per ton f.o.r.

NAPHTHALENE.—Sublimed flakes, £16 per ton ex works; crystals, £17 per ton.

POTASSIUM CARBONATE, 88/92%.—Price unchanged at about £29 per ton.

POTASSIUM CAUSTIC, 88/92%.—Moderate inquiry. Spot lots, £33 to £34 per ton ex store. Continental offers still high.

POTASSIUM CHLORATE.—Price 5d. per lb. delivered. Cheaper spot lots on offer

POTASSIUM NITRATE.—Fair inquiry for export. Quoted £29 to £30 f o b. Spot lots, £36 per ton ex store.

POTASSIUM PERMANGANATE.—Moderate inquiry. Quoted at 9½d. to 10d. per lb.

POTASSIUM PRUSSIATE.—In little request. Price 1s. 3d. per lb. ex station.

SODIUM ACETATE.—Little inquiry. Quoted £24 to £25 per ton.

SODIUM BICARBONATE.—Refined quality, £11 per ton; M.W. quality, £10 per ton ex station.

SODIUM BICHROMATE.—Makers' price unchanged at 5¼d. per lb. delivered.

SODIUM CARBONATE.—Soda crystals, £6 per ton ex quay; alkali, £9 12s. 6d. per ton ex quay. Usual local demand for soda.

SODIUM CAUSTIC.—76/77%, £25 10s.; 70/72%, £23 10s.; 60%, £26 5s.; 98/99% powdered, £29 to £30 ex station. moderate demand for export.

SODIUM HYPOSULPHITE.—Commercial quality, £13 10s. to £14 10s. ex store; pea crystals, £21 per ton ex store.

SODIUM NITRATE.—No change in price, £14 15s. per ton f.o.r. or f.o.b.; refined, £15.

SODIUM SILICATE, 140°.—English make, £10 to £11 per ton ex station, according to quantity.

SODIUM SULPHATE, SALTCAKE, 95%.—Price remains £4 per ton for home consumption on contract. Spot lots for export scarce.

SODIUM SULPHIDE, 60/65%.—£21 per ton ex station for solid; broken, £2 per ton more.

SULPHUR.—Flowers, £14; ground, £13; rock, £12; roll, £13. In little request.

ZINC CHLORIDE.—Continental offers of £23 per ton c.i.f.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHOL.—Some inquiry for the home market. Price quoted, 2s. 9d. per lb. delivered.

ALPHA NAPHTHYLAMINE.—Export inquiry. Quoted in ton lots at 2s. per lb.

ANILINE OIL.—Price remains firm at 1s. per lb. delivered.

ANILINE SALT.—Home makers' price, 1s. 1d. per lb.

ANTHRAQUINONE.—Home inquiry. Price quoted, 3s. 3d. per lb. carriage paid.

BENZIDINE BASE.—Demand for export. Offered at 6s. 6d. per lb., 100% basis.

BETA NAPHTHOL.—Brisker demand. Price firm at 1s. 3d. to 1s. 4d. per lb.

BETA NAPHTHOL R.—Some inquiries. Price, 1s. 6d. per lb., casks included, carriage paid.

BETA NAPHTHYLAMINE.—Inquiry for export. Price quoted, 5s. per lb.

GAMMA ACID.—Inquiries for home and export trades. Price quoted, 15s. per lb. on 100% basis.

" H " ACID.—Price remains firm, 7s. per lb., 100% basis.

MONOCHLORBENZOL.—Home inquiry. Price quoted, £80 per ton delivered.

N.W. ACID SODIUM SALT.—Offered at 7s. 11d. per lb., on 100% basis.

NAPHTHIONIC ACID, CRUDE.—Export inquiry. Price quoted, 2s. 11d. per lb. on 100% basis.

PARA AMIDOPHENOL BASE.—Inquiry for export. Price quoted, 7s. 6d. per lb. on 100% basis.

PARADICHLORBENZOL.—Inquiry for export. Offered at £50 per ton f.o.b. U.K. port, packages included.

PARANITRANILINE.—Home and export inquiries. Price quoted, 3s. 5d., in kegs; 3s. 4d. in ton lots, delivered or f.o.b.

PARANITROPHENOL.—Export inquiry. Price quoted, 2s. 3d. per lb., 100% basis.

SALICYLIC ACID, B.P.—Home inquiry. Price quoted, 1s. 6d. per lb.; technical, 9d. per lb. f.o.b.

SODIUM METANITROBENZENE SULPHONATE.—Some demand. Price quoted, 2s. 3d. per lb.

SOLVENT NAPHTHA.—Prices lower. At about 2s. 3d. per gallon, carriage paid, in sellers' tanks.

SULPHANILIC ACID.—Export inquiry. Price quoted, 1s. 6d. per lb., 100% basis.

TOLIDINE BASE.—Small inquiry. Price, 7s. per lb., 100% basis.

German Chemical Trade Notes

FROM OUR OWN CORRESPONDENT.

Berlin, May 15, 1922.

IT has been a quiet week for industrial chemicals, although manufacturers' stocks have been somewhat reduced on account of more adequate supplies of railway wagons. In spite of the fact that the undertone of the market is not strong, and an increased reluctance on the part of consumers, combined with urgent offerings from weak hands, some domestic producers seem to have exaggerated ideas of the value of their products. It is fairly generally felt that these prices bear no relation to the recent increases in wages and raw materials.

Many materials are scarce on spot and prices generally are stiffer. Export trade in chemicals shows some signs of falling off.

The following quotations are given in marks per kilogram (d.=domestic price, e.=export price):

ACIDS: Acetic, 80% chemically pure, 40.50/41 mk. d.; 50/52 mk. e. Acetyl-salicylic, 275/280 mk. d.; 360 mk. e. Benzoic, in strong demand at higher prices; average quotations 160 mk. d.; 180 mk. e. Boric, 83/84.25 mk. d. Carbolic, crude, 50/60%, 13 mk. d. Citric, 310 mk. d.; 320 mk. e. Formic, chemically pure, 50%, 18.50/20 mk. d.; 85%, 28/30 mk. e. Lactic, scarce at 25 mk. d. Oxalic, 42 mk. d.; 80 mk. e. Salicylic, 145/150 mk. d.; 195 mk. e. Tartaric, crystallised and powdered, 160 mk. d.; 190 mk. e.

INDUSTRIAL CHEMICALS: Alum: Potash crystal powder, 9 mk. d.; 12 mk. e.; potash, in lumps, 16 mk. d.; chrome, 15%, 35/36 mk. d.; 40/42 mk. e. Alumina sulphate, 14/15%, 8.50/9 mk. e.; 17/18%, 11 mk. e.; in good demand but supplies short. Ammonia carbonate powdered, 20 mk. d.; 29 mk. e.; in lumps, 25 mk. d. Barium chloride, in fair demand for export at 21/21.50 mk. Bleaching powder, 110/115%, in strong demand from abroad at 14 mk. Borax, crystallised, 41.75 mk. d. Copperas, 5.20 mk. d.; 6.50 mk. e. Copper sulphate, 98/100%, in good request from inland at 37 mk. d.; scarce for export at 40 mk. Epsom salt, 2.95 mk. d.; 4.70 mk. e. Formaldehyde, 30%, 53/62 mk. d.; 40%, 75 mk. d. Glauber's salt, technical, crystallised, 3 mk. d.; 4 mk. e. Glycerine, 28° Bé, 95 mk. d.; 105 mk. e. Magnesium chloride, fused, is unchanged at 6/7 mk. e. Potassium bichromate, 68 mk. d.; 75/80 mk. e. Potassium carbonate is in strong demand but very scarce; 80/85% is quoted at 26 mk. d.; 96/98%, 30 mk. d. Potash, caustic, 88/92%, 28 mk. d.; liquor, 50° Bé, 11.50 mk. d. Potassium chlorate is neglected at 32 mk. d.; 38/40 mk. e. Potassium metabisulphite, 55 mk. d.; 63 mk. e. Potassium permanganate, 70 mk. d.; 79 mk. e. Potassium prussiate, yellow, has advanced to 170 mk. d., and is in fair demand. Potash, Saltpetre, is unchanged at 29 mk. d. Salt cake has declined to 5.40 mk. d.; 6.50 mk. e. Soda crystals, 6.50/7.60 mk. d. Soda Ash, 96/98% is in good demand at 14 mk. d. Sodium Benzoate has advanced to 130 mk. d. Sodium Bicarbonate, PH. G. 5 quality, 8.50 mk. d.; 16/18 mk. e. Sodium Bichromate, 56 mk. d.; 66 mk. e. Sodium Caustic, 125/128° Bé, 32 mk. e.; liquor, 38/40°, 12.50 mk. d. Sodium Hyposulphite is unchanged at 16.50 mk. d.; 18.50 mk. e. Sodium Silicate, 38/40° Bé, has advanced to 5.50 mk. e. Sodium Sulphide, 30/32%, is unchanged at 10 mk. d.; 60/62%, 20 mk. d. Zinc Chloride is offered at 21 mk. d. Bone Glue, best quality, 62 mk. d. Cobalt Oxide is scarce at 1,100 mk. d. Dextrine, light yellow, 34 mk. d. Lead, red, 38/39.50 mk. d.; 42 mk. e. Lead, white, powdered, 42.50 mk. d.; in oil, 43 mk. e. Sugar of Lead, 46 mk. d.; 50 mk. e.

Disclosure of Trade Secrets

Manufacturing Chemist's Appeal Dismissed

IN the Court of Appeal, on May 12, the Master of the Rolls and Lords Justices Warrington and Younger had before them an appeal by Irvine Alexander Keene, described in the receiving order as the Keene Co., from an order of Mr. Justice Astbury, ordering him to disclose certain trade secrets. It will be remembered that Mr. Keene was ordered by the Registrar to disclose in writing to the Trustee in his bankruptcy the formulæ for articles which he had manufactured, known as Keene's Cold Cure, Keene's Corn Cure, and Razorine Paste. The Trustee had received an offer for the sale of the assets of the company on condition that the formulæ were obtained. The debtor contended that the knowledge and skill of himself or his brother were necessary to make the manufactured articles, and that the formulæ would be of little use without the personal factor. The order of the Registrar was affirmed by Mr. Justice Astbury, and the debtor now appealed.

Mr. Beyfus argued the case for the debtor, and stated that his client had been ordered to supply these formulæ on the ground that they were part of his property. He submitted that they were not, but that they were part of the debtor's skill and capacity. Further, he contended that the debtor had made these things by his secret process in partnership with his brother, and when they dissolved partnership they had agreed that the debtor should manufacture and deal in these things in England and America, and the brother in France. It was part of the agreement, and necessary for the protection of both brothers, that neither should disclose these secrets.

The Master of the Rolls, in giving judgment, said if these formulæ were known to have been written down, it could hardly have been contended that the debtor ought not to hand over the writing to the Trustee, but it was said as the knowledge was in the brain of the debtor, it did not constitute property within the meaning of the Bankruptcy Acts. In his view, that was not right. The formulæ were used in the manufacture of these articles, and they were part of the goodwill owned by the debtor. He must, therefore answer the questions as to those formulæ, and the appeal on that point failed. Next it was said that the debtor had carried on this business with his brother, upon terms that the secret should not be disclosed except in certain eventualities, and that when the partnership was dissolved, and by a deed between them, the brothers agreed each to carry on the business in different territories, it was implied that the secrecy would be presumed for the protection of both. But there was no condition in the deed as to secrecy. It was said that it was intended that they should remain bound by the agreement as to secrecy, but by the deed the business in England and America, with the goodwill, book debts, etc., became the property of the debtor. If he had been bound, as suggested, he would not have been able to sell the business to any purchaser, and it would not have become his sole property. Therefore the second point failed, and the appeal must be dismissed.

Lords Justices Warrington and Younger concurred.

Trade Marks Appeal

IN the Court of Appeal on Wednesday, consisting of the Master of the Rolls, and Lords Justices Warrington and Younger, the hearing was concluded of the appeal by the Bradford Dyers' Association, the Yorkshire Dyers, Lever Brothers, Ltd., Brunner, Mond and Co., Ltd., and numerous other leading British manufacturers, from the judgment of the late Mr. Justice Peterson dismissing their appeal from a decision of the Registrar of Trade Marks, disallowing the appellants' objections to the application by the Union Nationale Inter Syndicate des Marques Collectives, a union of French manufacturing syndicates and trade associations, to register the words "Unis France" printed inside a circle or oval curve to be registered as a trade-mark for French goods in all classes under Section 62 of the Trade Marks Act, 1905, as amended by the Second Schedule of the Trade Marks Act, 1919. At the conclusion of the arguments, their lordships dismissed the present appeal, holding that the applicant association had performed the conditions precedent which entitled them to registration of the mark, that the Registrar of Trade Marks was right in allowing the registration to proceed, and that Mr. Justice Peterson was right in affirming the decision of the Registrar.

Universities' Annual Conference

THE annual conference of the Universities of Great Britain and Ireland was held on May 13 at University College, London, Sir Donald MacAlister presiding.

Dr. M. O. Forster said it was very necessary to define the meaning of the word "research." The general public did not know what it was. Many young men came to him and said they wanted to take up "research," but when he asked them what they understood by that he rarely got an intelligent answer. The simplest explanation of the term he knew was that it was "learning how to solve a problem," and he thought that if the general public came to realise this a great deal more money would be forthcoming for the support of research.

Company News

BARRENECHEA NITRATE CO.—After providing for a bonus on the five-year notes, corporation profits tax, stoppage, repairs and administration expenses, the net profit for the year 1921 is £12,409, which increases the credit balance of the profit and loss account to £25,393. It is proposed to pay a dividend of 35 per cent., less tax, and to carry forward £9,643. The annual meeting will be held at Baltic House, 27, Leadenhall Street, London, on May 25, at 12.30 p.m. Dividend warrants will be posted on May 27.

SAN SEBASTIAN NITRATE CO.—The gross profit for 1921, including interest and transfer fees, was £14,797, from which have to be deducted expenses incurred in Chile during stoppage, June to December, 1921, £6,800, and London office charges, £2,116. The net profit is £5,881, and £11,366 was brought in, making £17,247. The directors propose to apply £10,000 to depreciation, leaving £7,247 to be carried forward. In view of the stagnant condition of the nitrate industry, the company's oficina was closed on May 31, 1921, and has not yet been reopened. The outlook is gradually improving, and it is hoped production may be resumed in the near future. Profit has been taken in the accounts on 66,617 quintals. The unsold stock of 82,563 quintals on hand at the oficina at December 31 last has been valued at cost. The annual meeting will be held at Winchester House, London, on May 25, at noon.

LEVER BROTHERS, LTD.—It is reported that the underwriters of the £4,000,000 5 per cent. first mortgage debenture stock, which was offered at 93½, will be required to take up 24 per cent. of the total. According to the circular issued in connexion with the arrangements for pooling £350,000 7 per cent. preference and £350,000 8 per cent. preference shares, the price at which members of the pooling syndicate will acquire the shares is 19s. 3d. net, payment to be made on June 12. The selling pool, unless previously liquidated, will remain in force until July 15. The profits of the pool will be divided between the participants in the following manner: (*a*) As to 20 per cent. to be divided between those participants who place shares in proportion to the number of shares placed by them; (*b*) as to the remaining 80 per cent., to the whole of the participants in proportion to their participation in the pool. A condition of the arrangement is that shares must not be sold upon the London market nor upon any markets other than the home markets of the individual participants.

CASTNER-KELLNER ALKALI CO., LTD.—The directors announce a dividend at the rate of 8 per cent., actual, for the six months to March 31 last, less tax, payable on May 24.

TARAPACA & TOCOPILLA NITRATE CO.—The transfer books are closed until June 1.

BRITISH COTTON & WOOL DYERS' ASSOCIATION.—The report to March 31 shows a net profit of £124,621, plus £21,595 brought in. The dividend is maintained at 10 per cent., £50,000 is placed to general reserve, £10,000 to the investment contingency fund, while £28,178 is carried forward. The annual meeting will be held in Manchester on May 24.

SPICER BROTHERS, LTD.—Meetings are being called for the purpose of carrying out an amalgamation of Spicer Brothers, Ltd., and James Spicer & Sons, Ltd., on the terms of an agreement which is being submitted to the shareholders of both companies for approval. The amalgamation will be effected by a transfer of the business of James Spicer & Sons, Ltd., to Spicer Brothers, Ltd. To carry out the proposed amalgamation the capital of Spicer Brothers, Ltd., will be increased. Up to 1865 the two businesses were one, but since that date they have been separate. The amalgamated company will be called, "Spicers, Ltd."

NEW PACCHA & JAZPAMPA NITRATE CO.—The trading for 1921 resulted in a profit of £12,207 (against £7,825), and after adding £959 brought forward and allowing £4,780 for debenture interest, etc., there is a disposable balance of £8,386. A dividend of 6 per cent., less tax (against 8 per cent.), requires £4,122, and it is proposed to carry forward the balance of £4,264.

CAMBRIAN ELECTROLYTIC ZINC CO., LTD.—Tenders are invited by the liquidator of the Welsh Mines Corporation, Ltd., and the Lisburne Development Syndicate, Ltd., for the surplus 15 per cent. participating preference shares of 5s. each (3s. paid up) of the Cambrian Electrolytic Zinc Co., Ltd., to be issued under the scheme of reconstruction and amalgamation of the above-named liquidating companies.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIAL.	REF. NO.
Melbourne ..	Drugs and chemical products ..	412/20/7/2083
Danzig	Soda, technical oils and fats for soap making	571
U.S.A.	Glass and glassware	225/4/F.G./M.C.A.
Melbourne ..	Drugs, pharmaceutical preparations	557
San Francisco ..	Linseed oil	—
Los Angeles ..	Linseed oil	—

Tariff Changes

INDIA.—Urea may now be imported into British India free from import duty.

PALESTINE.—The following articles are exempted from import duty: Sesame oil mills and crushers, parts, and accessories; chemical manures. The importation of explosives and salt is prohibited, but blasting explosives and saltpetre may be imported under special licence issued by the Director of Public Security. A special licence, issuable by the Department of Health, is required for the importation of cocaine, picrates, sodium chlorate, sulphonal, potassium chlorate, and opium.

ST. VINCENT.—The Customs duties have been increased by the levying of an additional duty of one-tenth of the duties at present leviable on each article specified in the Schedule.

TRINIDAD.—In order to benefit by the lower rate of duty provided for under the British Preferential Tariff, goods of British origin imported into Trinidad by parcel post must be accompanied by a certificate, which may be in the following shortened form: "I, the undersigned, declare that the contents of this package are the growth or produce or, if a manufactured article, is to the extent of at least one-fourth of its present value *bona fide* the manufacture of (Empire country of origin.)" If this certificate is not produced, Customs duty will be charged at the higher rates prescribed by the General Tariff.

Contracts Open

NOTTINGHAM (June 8).—Creosote oil, pitch, refined tar, disinfectants, cement. Forms from T. W. Gordon and tenders to W. J. Board, both at Guildhall, Nottingham.

DARWEN (May 27).—Oxide of iron (250 tons). Particulars from A. H. Smith, gas engineer, Darwen. Tenders to W. P. Halliwell, Town Clerk.

DURBAN (June 5).—400 tons coal tar (not water gas, coke oven or blast furnace tar). Particulars from and tenders to Webster, Steel and Co., 5, East India Avenue, London.

Registration of Business Names

THE Board of Trade under the authority conferred upon them by the Registration of Business Names Act, 1916, have appointed Mr. Henry Birtles, the Registrar of Joint Stock Companies, and Mr. Arthur Edwin Campbell-Taylor, the Assistant Registrar of Joint Stock Companies, to be Registrar and Assistant Registrar of Business Names, respectively, for the purposes of the Act.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

ALPINE CHEMICAL CO., LTD., Bee Chemical Works, St. Silas Street, Hull, chemical manufacturers, £17 10s. March 21.

CRANSTON, E., 314, Sangley Road, Catford, chemist, £10 9s. 1d. March 20.

MARCH PARREN & SONS, 140, Kingsland Road, N.E., chemists, £14 11s. 8d. March 10.

NOBLE, W. D., 2, Well Street, Cable Street, E., chemist, £55 2s. 6d. February 23.

STEWART, J. Dickson, 100, Richmond Road, South Kensington, chemist, £11 11s. March 20.

Bill of Sale

BRIGGS, Percy Redmond, 4A, Montagu Road, Hendon, chemical engineer. May 11. £60.

Deed of Arrangement

PRESCOTT, Alfred, Rutland Mills, Oswald Street, Hulme, Lumb Mill, Sowerby Bridge, and Holt Town Chemical Works, Pump Street, Manchester, chemical merchant and manufacturer. Trustee, T. Boardman, 49, Spring Gardens, Manchester. Filed, May 10. Secured creditors, £10,762; liabilities unsecured, £45,001; assets, less secured claims, £8,035. The following are creditors:—Kemball, Bishop & Co., Ltd., £10,990; Shell Mex, Ltd., £990; Vormeire Van Geeteruyen C. Hammo (Belgique) £10,440; Roberts, Evans & Woodhead, Liverpool, £800; Leitch, J. W., & Co., Milnsbridge, £182; Pure Bone Phosphate Co., Ltd., Newark, £158; Helm Chocolate, Ltd., Wallington, £162.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary is also given—marked with an *—followed by the date of the Summary but such total may have been reduced.*]

BUDDEN & CO., LTD., Liverpool, chemists.—Registered May 1, £500 1st mortgage and £150 2nd mortgage. *Nil. March 29, 1922.

HALL (L.C.), LTD., Norwich, chemists.—Registered April 29, £300 debentures, present issue £100; general charge.

HARRISON (ELIJAH) & CO., LTD., Liverpool, oil merchants &c.—Registered May 3, mortgage, to bank; charged on 2, 2A, or 4, Islington Row, Liverpool. *£500. January 12, 1922.

PARIPAN, LTD., London, W., manufacturers of paints, &c.—Registered May 2, £45,000 debentures, to bank; general charge; also registered May 2, eight mortgages by way of collateral security, to bank; charged on various properties. *——. February 2, 1922.

ROSE METAL POLISH CO., LTD., Brighton.—Registered May 2, £100 debentures, part of £2,000; general charge. *£650. November 3, 1921.

Satisfactions

BENTON, KEIGHLEY & REYNOLDS, LTD., London, E.C., chemical engineers, &c.—Satisfactions registered May 5, £500, registered November 17, 1906; £250, registered November 30, 1906; £250, registered January 21, 1907; £950, registered November 21, 1910; and £297, registered November 21, 1910.

HARKER (C. R.), STAGG & MORGAN, LTD., London, E., chemists.—Satisfaction registered May 6, £7,600, part of amounts registered October 21, 1902, January 1, 1903, and April 8, 1903.

Receiverships

BRITISH ANTAPSAL CO., LTD. L. E. Green, of 58, Great Portland Street, W., was appointed receiver on April 29, under powers contained in debentures dated July 1, 1921.

HIRST AND CO., LTD. R. L. Marsden, of Chesterfield, has been appointed receiver and manager pursuant to Order of Court dated April 12, 1922.

HORTON MANUFACTURING CO., LTD. R. F. W. Fincham, 3, Warwick Court, Grays Inn, W.C., was appointed receiver and manager on April 28, under powers contained in debentures dated May 10, 1921.

INESON GIBBS OIL AND CHEMICAL CO., LTD. R. L. Biggs, of 22, Church Street, Birmingham, was appointed receiver on May 4, under powers contained in a debenture dated November 8, 1920.

NOBLES DRUG STORES, LTD. W. D. Noble, of 2, Well Street, Cable Street, E., was appointed receiver and manager on April 20, under powers contained in instrument dated June 24, 1911.

OWEN BROTHERS (BIRMINGHAM), LTD. G. G. Poppleton, of 26, Corporation Street, Birmingham, was appointed receiver and manager on April 28, under powers contained in debentures dated August 31, 1920, and October 19, 1921.

London Gazette

Company Winding up Voluntarily

POLYCHROME CO., LTD. T. B. Brown, 63, Deansgate Arcade, Manchester, appointed liquidator.

Bankruptcy Information

SOUTHERST, John, carrying on business as THE FARNWORTH MACHINE GLASS CO., Farnworth, co. Lancaster, also as SOUTHERSTS at Thornton Street, Collyhurst, Manchester, glass bottle manufacturer. Receiving order, May 13. Debtor's petition.

Notice of Dividend

KEATS, Philip Phineas, 167, Mary Street, Balsall Heath Birmingham, chemist. Amount per £, 10s. 3½d. First and final. Payable, May 24, 5, Waterloo Street, Birmingham.

Notices of Intended Dividends

AINLEY, Edward Theodore, Woodhall Street, Bury St. Edmunds, chemist. Last day for receiving proofs, May 27. Trustee, T. W. J. Britten, 5, Butter Market, Ipswich.

BUSH, Emil Frederick, 120, High Road, New Southgate, Middlesex, colour and chemical merchant. Last day for receiving proofs, May 31. Trustee, F. W. Davis, 28, Theobald's Road, London, W.C.1.

THOMPSON, John, lately carrying on business as THE THOMPSON CHEMICAL CO., 105, George Street, Manchester, chemical manufacturer. Last day for receiving proofs, May 27. Trustee, J. G. Gibson, Official Receiver, Byrom Street, Manchester.

Partnerships Dissolved

ROBINSON, Albert, PILLING, Ellen, and PILLING, Harry, Newnham Street, Bolton, soap manufacturers, under the style of the ASTLEY DYE AND CHEMICAL CO., by mutual consent as from February 23, 1922. Debts received and paid by E. Pilling and H. Pilling, who will continue the business.

THE MILLBAY SOAP AND NEW PATENT CANDLE CO., LTD. BROWN, Joseph Pearce, and BROWN, John, manufacturers of edible oils, Plymouth, under the style of the DEVON OLEO CO., by mutual consent as from December 31, 1921. Debts received and paid by J. P. Brown and J. Brown.